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JANUARY 1975 75c (40p)
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THE BORDERLAND OF SOL
Larry Niven

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DISCON II More than 4,000 SF fans attending the World SF Convention in Washington, DC over the Labor Day 1974 weekend, saw Ben Bova and Kelly Freas repeat last year's performance in winning the Science Fiction Achievement Awards—or Hugos—for the Best Professional Editor and Best Professional Artist, respectively. Members of the convention voted the John W. Campbell Award for Best New Writer in the SF Field jointly to Spider Robinson and Lisa Tuttle. This award, introduced a year ago and sponsored by Condé Nast Publications, Inc., is open to all SF writers whose first work was published in the three years preceding the award. A new award, the "Gandalf," for contributions to the fantasy genre, sponsored by Lin Carter, was awarded posthumously to J. R. R. Tolkien.

The SF Achievement Awards are called Hugos after Hugo Gernsback, publisher of the first magazine devoted entirely to science fiction. The Hugos, the John W. Campbell Award, and the Gandalf are made by the science-fiction readers themselves.

Winners of the Hugos in the other Professional categories were:
Novel: "Rendezvous with Rama" by Arthur C. Clarke
Novella: "The Girl Who Was Plugged In" by James Tiptree, Jr.
Novelette: "Deathbird" by Harlan Ellison
Short Story: "The Ones Who Walk Away from Omelas" by Ursula K. Le Guin
Dramatic Presentation: "Sleeper"

The convention committee presented a special award to SF astronomical artist Chesley Bonestell.
A committee of SF artists presented a special award to artist Richard Powers for excellence in the field.

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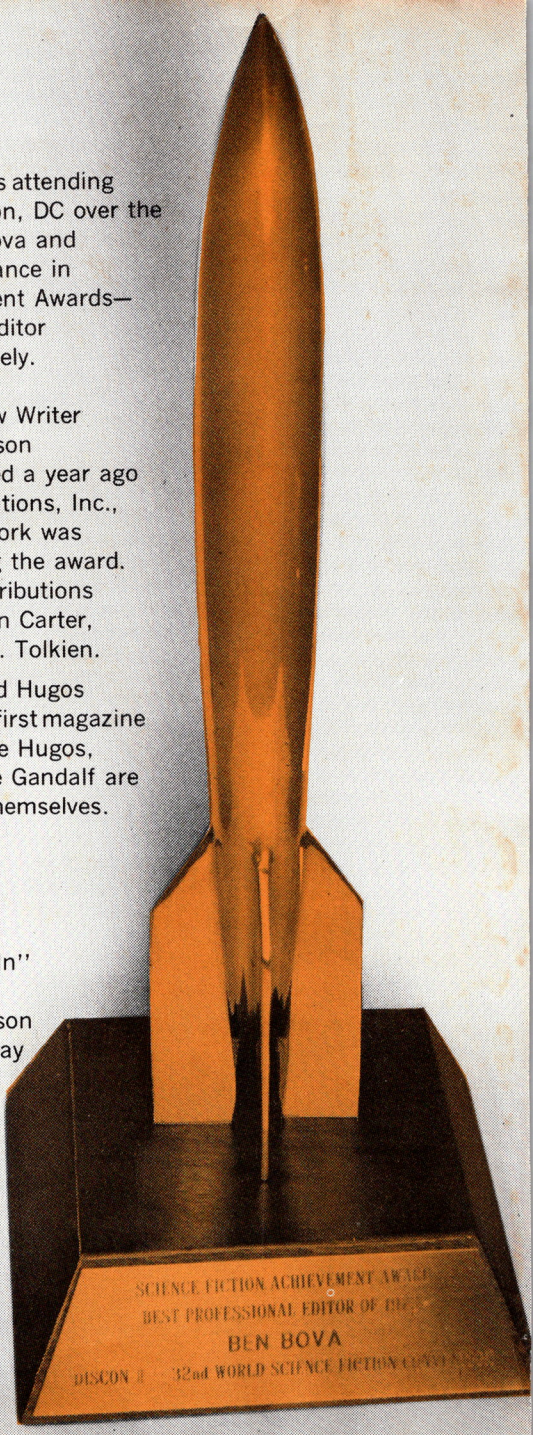

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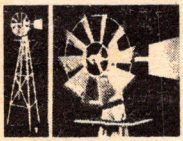

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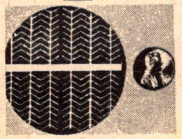

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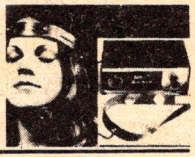

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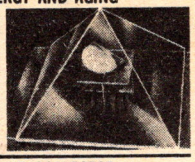

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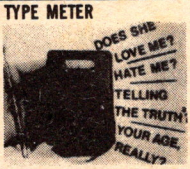

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Next Issue on Sale January 7, 1975
$7.50 per year in the U.S.A.
75 cents per copy

Cover by John Schoenherr

Vol. XCIV, No. 5 / JANUARY 1975

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POSTMASTER: SEND FORM 3579 to ANALOG SCIENCE FICTION/SCIENCE FACT, BOX 5205, BOULDER, COLORADO 80302.

Editorial and Advertising offices: Condé Nast Building, 350 Madison Avenue, New York, New York 10017
Subscriptions: Analog Science Fiction/Science Fact, Box 5205, Boulder Colorado 80302

1974

the year that was

editorial

This is being written in September, but even though it's only three-quarters finished, 1974 has been one of the most significant years in human history. Some of the events that took place during this year will be recorded in histories for all time to come.

I am *not* referring to trivialities such as politics, although the Nixon resignation was certainly a significant event in American political history. Many Americans have grown very cynical about the workings of our Government. Yet if the Watergate scandal proved anything, it was that nothing stood between the American people and the most dastardly abuse of Presidential power ever seen, except a pair of newspaper reporters—and it was enough.

The sovereign power, in our system of government, truly resides in the people, although the great mass of the electorate is generally too uninformed or too uncaring to wield that power. But when the average voter became convinced that the Nixon Administration was crooked, the most powerful single individual on the face of the Earth was out of a job, in a matter of weeks.

The new President's pardon of the old one has kept the political pot boiling, and as this is being written charges and countercharges still ring in the murky Washington air. But the politicians seem to have an edgy look about them, as if they're afraid that someone is watching them closely and carrying a stiff new broom. It's a delight to see.

But all that *is* trivial, compared to what's happened in Ann Arbor this year: nothing less than a successful demonstration of thermonuclear fusion. No one knows in what year fire was discovered by our *Homo erectus* ancestors; but half a

million years later, an event of similar magnitude has taken place.

It's poetic justice that the first fusion reaction occurred in the year of the great "energy crisis." Early in 1974 the American public awoke for the first time to the fact that the world's supply of oil is limited, dwindling, and in the hands of people who are perfectly content to raise the prices as high as the customers will bear. And then some.

The fusion demonstration took place at KMS Fusion, Inc., a subsidiary of KMS Industries. While there is still an outside chance that what the KMS researchers observed was not truly a fusion reaction, the evidence seems very strong that their experiment was successful.

The KMS team uses laser energy to create an implosion in a spherical pellet that is apparently made of polyethylene in which the hydrogen atoms have been replaced by deuterium or tritium atoms, the heavier and more-easily fusible isotopes of ordinary hydrogen. The details of the pellet construction and the laser optics are being kept under proprietary wraps by KMS, pending action by the Government on their patent applications. KMS is a private, profit-making industrial firm; not a government or university laboratory.

The laser-driven implosion of the 60-to-80-micron pellet creates the plasma conditions for fusion. The peak output power of the laser system is 500 gigawatts (yes, lasers have been getting stronger!) and the power focused on the pellet is 200 to 500 terawatts per square centimeter (2 to 5 $\times$ 10^{15} W/cm^2). Squeezed with that kind of energy, the deuterium and/or tritium atoms fuse together to produce helium, heat, and very energetic neutrons.

The neutrons are the chief diagnostic evidence of the reaction. The KMS experimenters report as many as 300,000 neutrons per shot.

Most of the competing fusion research teams—many of them at AEC laboratories and working on the older, more frustrating "magnetic containment" type of fusion apparatus—have withheld judgment about the KMS claim. They want to see more evidence.

Meanwhile, KMS is going ahead with studies of how to *use* a laser-driven fusion reaction to produce practical energy. While many of the world's top physicists have struggled for nearly thirty years to produce a fusion reaction, comparatively little thinking has been done about how to turn a fusion reaction into useful forms of energy. Some vague ideas about harnessing fusion to produce electricity have been mentioned; but after all, that's an engineering problem!

The KMS team is considering using the neutrons from fusion to split water into hydrogen and oxygen—both commercially useful elements. Also, the neutrons could be used to convert coal and calcium carbonate directly into methane.

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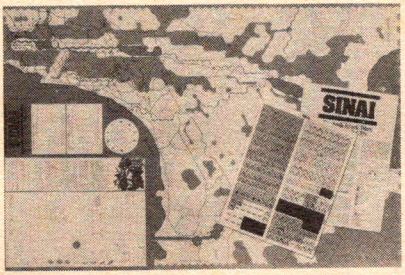

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Both hydrogen and methane would be enormously valuable as cheap, clean fuels. KMS is also investigating applications of energetic neutrons to other chemical processes, particularly photochemistry. They are working with Texas Gas Transmission and other commercial firms, and Burmah Oil, Inc., an international energy company based in Scotland, is on the verge of investing some twenty million dollars in KMS.

It was also a busy year for the geneticists. In England, Professor Douglas Bevis of Leeds University announced that several "test-tube" human babies had been born: one in England and two in western Europe.

Ova were removed from the mothers, fertilized with sperm in the laboratory and incubated there for six days. The fertilized ova are then replaced in the mothers' wombs, and the fetuses allowed to come to term naturally. This is a long way from the standard science fiction concept of fertilization and gestation entirely in an artificial apparatus. But it is a first step, and a crucial one.

The biggest flurry of excitement over this announcement was on the moral issues raised. Bevis refused to name the scientists who had performed the experiments, although he later admitted that he himself participated in one of the cases. None of the others have come forward to identify themselves. In the United States, researchers have been strongly dissuaded from such experiments with human subjects, mainly by an edict from the National Institutes of Health that NIH will fund animal experiments, but not human studies. One researcher, Landrum B. Shettles at Columbia University, was actively stopped from proceeding with human test-tube experiments.

Meanwhile, on a different but related front, a team of molecular biologists called a press conference to ask for a moratorium on certain aspects of genetic engineering research.

Eleven members of the National Academy of Sciences, including four who were actively engaged in the research they seek to restrain, warned the public that the newfound ability to shuffle genes in bacteria presents enormous hazards that could lead to unstoppable epidemics.

The geneticists have learned how to take individual genes from an animal, virus or bacterium and weld it into the gene chain of another organism. So far, the recipient organism has been the bacterium *Escherichia coli*, a favorite "experimental animal" of the geneticists. In these experiments, *E. coli* bacteria have received genes from frogs, mice and fruit flies.

This capability could eventually produce a revolution in many industries. For example, the gene for

insulin production could be taken from human DNA and placed in a bacterial host, which would then merrily produce insulin at a fraction of the current costs and difficulties. Nitrogen-fixation genes could be similarly harvested, and eventually human genetic disorders could be corrected, using the same procedure.

But there's another edge to the sword. New types of infectious diseases could be produced by the combination of various DNA elements in bacterial hosts, and the geneticists are particularly worried because good old *E. coli* lives quite comfortably in the human intestinal tract. We could carry a colony of mutated bacteria, whose effects on the human body are unknown, and possibly untreatable by existing medicines.

The prospects for biological warfare or just plain accident are too horrifying to accept calmly, so the scientists have called for a temporary halt to all such research. They want the scientific community to set up procedures and safeguards to make certain that such accidents won't happen. This is somewhat similar to setting up safety standards in other fields of research, such as nuclear energy. But as history has shown, it's extremely tough to make such standards foolproof, and even tougher to keep potential weaponry information from being turned into weapons.

The geneticists hope to be able to create a self-policing capability among the researchers. If they succeed in doing so, it will be history-making. If they fail, there just might not be any further history.

Meanwhile, back in the physics labs, the high-energy particle physicists have made the most important fundamental breakthrough since Einstein's time.

The dream of the physicists is to reduce the universe to a single equation. Einstein looked at the world and saw four fundamental forces at play: gravity, electromagnetism, the strong nuclear force and the weak nuclear force. (The strong nuclear force holds the nucleus of atoms together; the weak force is responsible for slow radioactive decay.)

Einstein wanted to produce a Universal Field Theory, to prove that each of these four forces was merely a facet of a single universal force. This year, in experiments at the Argonne National Laboratory and the Fermi National Accelerator Laboratory, physicists have uncovered evidence that links the weak nuclear force with electromagnetism. Instead of four basic forces in the universe, we now have three. And perhaps only two, because there is some evidence that suggests the two nuclear forces merge together. (To go into detail on these experiments would take more room—and knowledge—than I have available. If any readers want to do an article for Analog on this subject, please write me a letter about it.)

The practical consequences of this research? None whatsoever, as far as anyone can see right now. But there were no practical consequences of Einstein's work, either—right away. Today, in a world of nuclear power, lasers, solid state electronics, et cetera, the research of Einstein's generation is paying off handsomely. The *eventual* results of this probing into nature's fundamental constitution might include antigravity, teleportation, or nothing at all. Except the thrill of *knowing*, which is what science is really all about.

And while most Americans feel that the space program is moribund, NASA has started the true exploration of the Solar System. Pioneer 10 photographed Jupiter in December 1973 (close enough to be included in this year's news) and Mariner 10 has probed both Venus and Mercury.

The most interesting fact to come out of these explorations is that the inner worlds of the Solar System are all two-faced. Mercury, the Moon, Mars, and even our own Earth have decidedly different surface structures on each of their two hemispheres. Why?

Pioneer 10 destroyed all the science fiction stories that picture human colonies on the inner moons of Jupiter. The giant

planet's fierce radiation belt makes human habitation of all but the outermost Galilean moon totally impossible; unless someone comes up with some truly staggering radiation protection.

The real news in space affairs is that a few people are beginning to see beyond the relatively timid research efforts of today, and are looking toward much more ambitious endeavors. In Minneapolis a group of young enthusiasts has formed a private corporation, Space Merchants, for the express purpose of developing private, profit-making spaceflight operations. They may well be twenty years ahead of their time, but so were Wernher von Braun, Arthur C. Clarke, and Robert Goddard.

And the large-scale colonization of space, using 30-kilometer-long satellites to house millions of human emigrants, was featured in the September 1974 issue of the normally-staid *Physics Today*, a publication of the American Institute of Physics. The article was written by Dr. Gerard K. O'Neill, professor of physics at Princeton, who believes that the first such colonization satellite can be in orbit by 1988. Not only can be, but should be. He makes an interesting case, and considers economics as well as engineering in his estimates.

If space colonization is looking practical, and even necessary, to the "straight" physicists, then 1974 is indeed a banner year.

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Lest we get too optimistic, however, we should also realize that the famines predicted more than a decade ago have started, in the Sahel region of Africa and elsewhere. Millions are starving already. Many more will be before long.

At the World Population Conference in Bucharest, at the Law of the Sea Conference in Caracas, at the bargaining tables of the Middle East, it is quite clear that the basic conflict on this globe is no longer East *vs.* West. It is rich *vs.* poor. The resources of this planet are failing to meet the needs of our expanding population. The countdown has started.

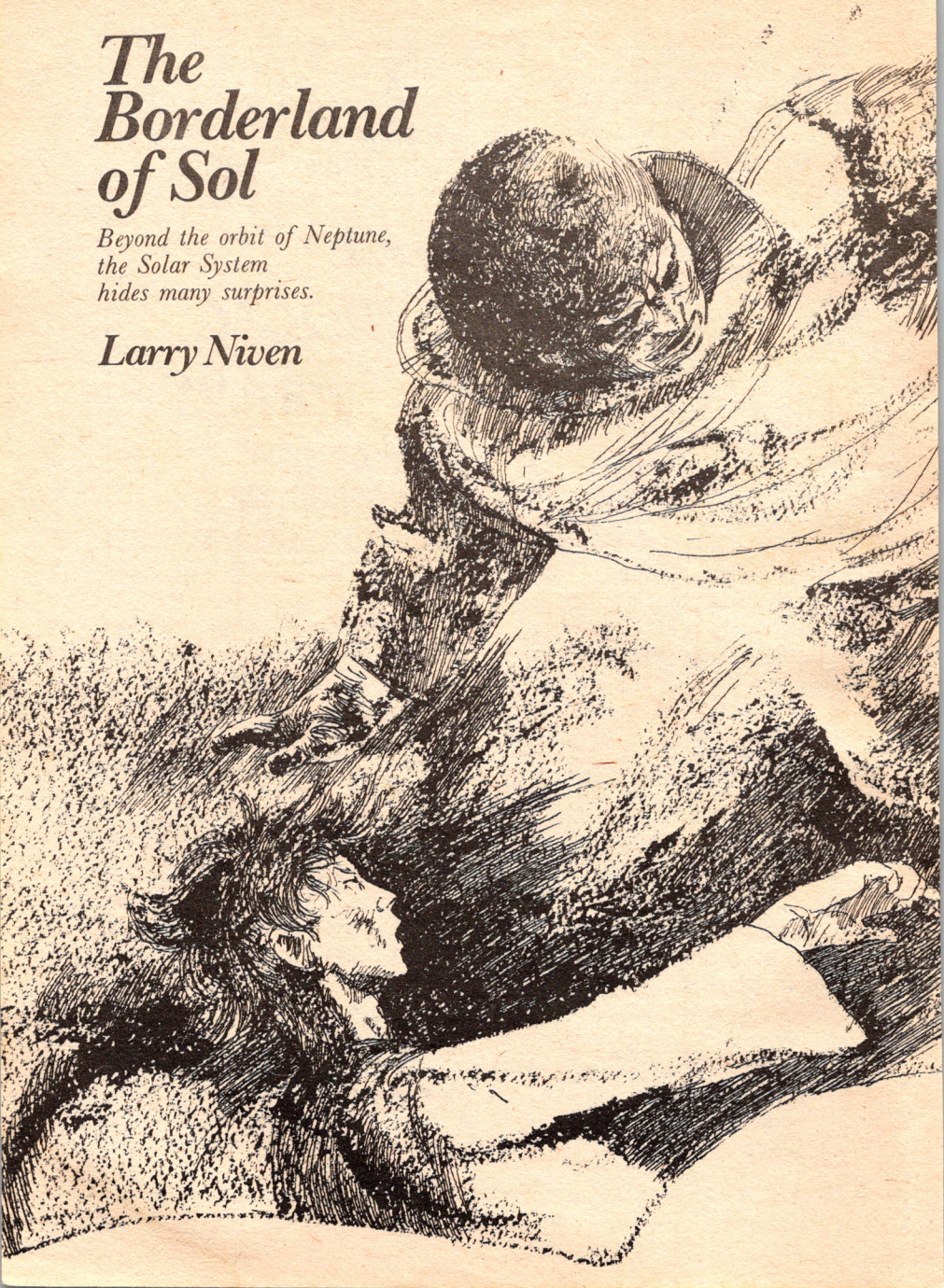
And 1984 is only a decade away.

THE EDITOR

The Borderland of Sol

Beyond the orbit of Neptune, the Solar System hides many surprises.

Larry Niven



John Schoenherr

Three months on Jinx, marooned.

I played tourist for the first couple of months. I never saw the high-pressure regions around the ocean because the only way down would have been with a safari of hunting tanks. But I traveled the habitable lands on either side of the sea, the East Band civilized, the West Band a developing frontier. I wandered the East End in a vacuum suit, toured the distilleries and other vacuum industries, and stared up into the orange vastness of Primary, Jinx's big twin brother.

I spent most of the second month between the Institute of Knowledge and the Camelot Hotel. Tourism had palled.

For me, that's unusual. I'm a born tourist. But—

Jinx's 1.78 gravities put an unreasonable restriction on elegance and ingenuity in architectural design. The buildings in the habitable bands all look alike: squat and massive.

The East and West Ends, the vacuum regions, aren't that different from any industrialized moon. I never developed much of an interest in touring factories.

As for the ocean shorelines, the only vehicles that go there go to hunt bandersnatchi. The bandersnatchi are freaks: enormous, intelligent white slugs the size of mountains. They hunt the tanks. There are rigid restrictions to the equipment the tanks can carry, covenants established between men and bandersnatchi, so that the bandersnatchi win about forty percent of the duels. I wanted no part of that.

And all my touring had to be done in three times the gravity of my homeworld.

I spent the third month in Sirius Mater, and most of that in the Camelot Hotel, which has gravity generators in most of the rooms. When I went out I rode a floating contour couch. I passed like an invalid among the Jinxians, who were amused. Or was that my imagination?

I was in a hall of the Institute of Knowledge when I came on Carlos Wu running his fingertips over a kdatlyno touch-sculpture.

A dark, slender man with narrow shoulders and straight black hair, Carlos was lithe as a monkey in any normal gravity; but on Jinx he used a travel couch exactly like mine. He studied the busts with his head tilted to one side. And I studied the familiar back, sure it couldn't be him.

"Carlos, aren't you supposed to be on Earth?"

He jumped. But when the couch spun around he was grinning. "Bey! I might say the same for you."

I admitted it. "I was headed for Earth, but when all those ships started disappearing around Sol System the captain changed his mind and steered for Sirius. Nothing any of the passengers could do

about it. What about you? How are Sharrol and the kids?"

"Sharrol's fine, the kids are fine, and they're all waiting for you to come home." His fingers were still trailing over the Lloobee touch-sculpture called *Heroes,* feeling the warm, fleshy textures. *Heroes* was a most unusual touch-sculpture; there were visual as well as textural effects. Carlos studied the two human busts, then said, "That's *your* face, isn't it?"

"Yah."

"Not that you ever looked that good in your life. How did a kdatlyno come to pick Beowulf Shaeffer as a classic hero? Was it your name? And who's the other guy?"

"I'll tell you about it sometime. Carlos, what are you doing *here?*"

"I . . . left Earth a couple of weeks after Louis was born." He was embarrassed. Why? "I haven't been off Earth in ten years. I needed the break."

But he'd left just before I was supposed to get home. And . . . hadn't someone once said that Carlos Wu had a touch of the flatland phobia? I began to understand what was wrong. "Carlos, you did Sharrol and me a valuable favor."

He laughed without looking at me. "Men have killed other men for such favors. I thought it was . . . tactful . . . to be gone when you came home."

Now I knew. Carlos was here because the Fertility Board on Earth would not favor me with a parenthood license.

You can't really blame the Board for using any excuse at all to reduce the number of producing parents. I am an albino. Sharrol and I wanted each other; but we both wanted children, and Sharrol can't leave Earth. She has the flatland phobia, the fear of strange air and altered days and changed gravity and black sky beneath her feet.

The only solution we'd found had been to ask a good friend to help.

Carlos Wu is a registered genius with an incredible resistance to disease and injury. He carries an unlimited parenthood license, one of sixty-odd among Earth's eighteen billion people. He gets similar offers every week . . . but he is a good friend, and he'd agreed. In the last two years Sharrol and Carlos had had two children, who were now waiting on Earth for me to become their father.

I felt only gratitude for what he'd done for us. "I forgive you your odd ideas on tact," I said magnanimously. "Now. As long as we're stuck on Jinx, may I show you around? I've met some interesting people."

"You always do." He hesitated, then, "I'm not actually stuck on Jinx. I've been offered a ride home. I may be able to get you in on it."

"Oh, really? I didn't think there were any ships going to Sol System these days. Or leaving."

"This ship belongs to a government man. Ever heard of a Sigmund Ausfaller?"

"That sounds vaguely . . . Wait! Stop! The last time I saw Sigmund Ausfaller, he had just put a bomb aboard my ship!"

Carlos blinked at me. "You're kidding."

"I'm not."

"Sigmund Ausfaller is in the Bureau of Alien Affairs. Bombing spacecraft isn't one of his functions."

"Maybe he was off duty," I said viciously.

"Well, it doesn't really sound like you'd want to share a spacecraft cabin with him. Maybe—"

But now I'd thought of something else, and now there just wasn't any way out of it. "No, let's meet him. Where do we find him?"

"The bar of the Camelot," said Carlos.

Reclining luxuriously on our travel couches, we slid on air cushions through Sirius Mater. The orange trees that lined the walks were foreshortened by gravity; their trunks were thick cones, and the oranges on the branches were not much bigger than Ping-Pong balls.

Their world had altered them, even as our worlds have altered you and me. An underground civilization and point six gravities have made of me a pale stick-figure of a man, tall and attenuated. The Jinxians we passed were short and wide, designed like bricks, men and women both. Among them the occasional offworlder seemed as shockingly different as a kdatlyno or a Pierson's puppeteer.

And so we came to the Camelot.

The Camelot is a low two-story structure that sprawls like a cubistic octopus across several acres of downtown Sirius Mater. Most offworlders stay here, for the gravity control in the rooms and corridors and for access to the Institute of Knowledge, the finest museum and research complex in human space.

The Camelot Bar carries one Earth gravity throughout. We left our travel couches in the vestibule and walked in like men. Jinxians were walking in like bouncing rubber bricks, with big happy grins on their wide faces. Jinxians love low gravity. A good many migrate to other worlds.

We spotted Ausfaller easily: a rounded, moon-faced flatlander with thick, dark, wavy hair and a thin black mustache. He stood as we approached. "Beowulf Shaeffer!" he beamed. "How good to see you again! I believe it has been eight years or thereabouts. How have you been?"

"I lived," I told him.

Carlos rubbed his hands together briskly. "Sigmund! Why did you bomb Bey's ship?"

Ausfaller blinked in surprise. "Did he tell you it was his ship? It wasn't. He was thinking of stealing it. I reasoned that he would not

steal a ship with a hidden time bomb aboard."

"But how did you come into it?" Carlos slid into the booth beside him. "You're not police. You're in the Extremely Foreign Relations Bureau."

"The ship belonged to General Products Corporation, which is owned by Pierson's puppeteers, not human beings."

Carlos turned on me. "Bey! Shame on you."

"Dammit! They were trying to blackmail me into a suicide mission! And Ausfaller let them get away with it! And that's the least convincing exhibition of tact I've ever seen!"

"Good thing they soundproof these booths," said Carlos. "Let's order."

Soundproofing field or not, people were staring. I sat down. When our drinks came I drank deep. Why had I mentioned the bomb at all?

Ausfaller was saying, "Well, Carlos, have you changed your mind about coming with me?"

"Yes, if I can take a friend."

Ausfaller frowned, looked at me. "You wish to reach Earth too?"

I'd made up my mind. "I don't think so. In fact, I'd like to talk you out of taking Carlos."

Carlos said, "Hey!"

I overrode him. "Ausfaller, do you know who Carlos *is?* He had an unlimited parenthood license at the age of eighteen. Eighteen! I don't mind you risking your own life, in fact I love the idea. But his?"

"It's not that big a risk!" Carlos snapped.

"Yah? What has Ausfaller got that eight other ships didn't have?"

"Two things," Ausfaller said patiently. "One is that we will be incoming. Six of the eight ships that vanished were *leaving* Sol System. If there are pirates around Sol, they must find it much easier to locate an outgoing ship."

"They caught two incoming. Two ships, fifty crew and passengers, gone. Poof!"

"They would not take me so easily," Ausfaller boasted. "The *Hobo Kelly* is deceptive. It seems to be a cargo and passenger ship, but it is a warship, armed and capable of thirty G's acceleration. In normal space we can run from anything we can't fight. We are assuming pirates, are we not? Pirates would insist on robbing a ship before they destroy it."

I was intrigued. "Why? Why a disguised warship? Are you *hoping* you'll be attacked?"

"If there are actually pirates, yes, I hope to be attacked. But not when entering Sol System. We plan a substitution. A quite ordinary cargo craft will land on Earth, take on cargo of some value, and depart for Wunderland on a straight-line course. My ship will replace it before it has passed through the asteroids. So you see, there is no risk

of losing Mr. Wu's precious genes."

Palms flat to the table, arms straight, Carlos stood looming over us. "Diffidently I raise the point that they are my futzy genes and I'll do what I futzy please with them! Bey, I've already had my share of children, and yours too!"

"Peace, Carlos. I didn't mean to step on any of your inalienable rights." I turned to Ausfaller. "I still don't see why these disappearing ships should interest the Extremely Foreign Relations Bureau."

"There were alien passengers aboard some of the ships."

"Oh."

"And we have wondered if the pirates themselves are aliens. Certainly they have a technique not known to humanity. Of six outgoing ships, five vanished after reporting that they were about to enter hyperdrive."

I whistled. "They can precipitate a ship out of hyperdrive? That's impossible. Isn't it? Carlos?"

Carlos' mouth twisted. "Not if it's being done. But I don't understand the principle. If the ships were just disappearing, that'd be different. Any ship does that if it goes too deep into a gravity well on hyperdrive."

"Then . . . maybe it isn't pirates at all. Carlos, could there be living beings in hyperdrive, actually eating the ships?"

"For all of me, there could. I don't know everything, Bey, contrary to popular opinion." But after a minute he shook his head. "I don't buy it. I might buy an uncharted mass on the fringes of Sol System. Ships that came too near in hyperdrive would disappear."

"No," said Ausfaller. "No single mass could have caused all of the disappearances. Charted or not, a planet is bounded by gravity and inertia. We ran computer simulations. It would have taken at least three large masses, all unknown, all moving into heavy trade routes, simultaneously."

"How large? Mars' size or better?"

"So you have been thinking about this too."

Carlos smiled. "Yah. It may sound impossible, but it isn't. It's only improbable. There are unbelievable amounts of garbage out there beyond Neptune. Four known planets and endless chunks of ice and stone and nickel-iron."

"Still, it is most improbable."

Carlos nodded. A silence fell.

I was still thinking about monsters in hyperspace. The lovely thing about that hypothesis was that you couldn't even estimate a probability. We knew too little.

Humanity has been using hyperdrive for almost four hundred years now. Few ships have disappeared in that time, except during wars. Now, eight ships in ten months, all around Sol System.

Suppose one hyperspace beast had discovered ships in this region,

say during one of the Man-Kzin Wars? He'd gone to get his friends. Now they were preying around Sol System. The flow of ships around Sol is greater than that around any three colony stars. But if more monsters came, they'd surely have to move on to the other colonies.

I couldn't imagine a defense against such things. We might have to give up interstellar travel.

Ausfaller said, "I would be glad if you would change your mind and come with us, Mr. Shaeffer."

"Um? Are you sure you want me on the same ship with you?"

"Oh, emphatically! How else may I be sure that you have not hidden a bomb aboard?" Ausfaller laughed. "Also, we can use a qualified pilot. Finally, I would like the chance to pick your brain, Beowulf Shaeffer. You have an odd facility for doing my job for me."

"What do you mean by that?"

"General Products used blackmail in persuading you to do a close orbit around a neutron star. You learned something about their homeworld—we still do not know what it was—and blackmailed them back. We know that blackmail contracts are a normal part of puppeteer business practice. You earned their respect. You have dealt with them since. You have dealt also with Outsiders, without friction. But it was your handling of the Lloobee kidnapping that I found impressive."

Carlos was sitting at attention. I hadn't had a chance to tell him about that one yet. I grinned and said, "I'm proud of that myself."

"Well you should be. You did more than retrieve known space's top kdatlyno touch-sculptor: you did it with honor, killing one of their number and leaving Lloobee free to pursue the others without publicity. Otherwise the kdatlyno would have been annoyed."

Helping Sigmund Ausfaller had been the farthest thing from my thoughts for these past eight years; yet suddenly I felt damn good. Maybe it was the way Carlos was listening. It takes a lot to impress Carlos Wu.

Carlos said, "If you thought it was pirates, you'd come along, wouldn't you, Bey? After all, they probably can't *find* incoming ships."

"Sure."

"And you don't really believe in hyperspace monsters."

I hedged. "Not if I hear a better explanation. The thing is, I'm not sure I believe in supertechnological pirates either. What about those wandering masses?"

Carlos pursed his lips, said, "All right. The Solar System has a good number of planets—at least a dozen so far discovered, four of them outside the major singularity around Sol."

"And not including Pluto?"

"No, we think of Pluto as a loose moon of Neptune. It runs *Neptune, Persephone, Caïna, Ante-*

nora, Ptolomea, in order of distance from the Sun. And the orbits aren't flat to the plane of the system. Persephone is tilted at a hundred and twenty degrees to the system, and retrograde. If they find another planet out there they'll call it *Judecca.*"

"Why?"

"Hell. The four innermost divisions of Dante's Hell. They form a great ice plain with sinners frozen into it."

"Stick to the point," said Ausfaller.

"Start with the cometary halo," Carlos told me. "It's very thin: about one comet per spherical volume of the Earth's orbit. Mass is denser going inward: a few planets, some inner comets, some chunks of ice and rock, all in skewed orbits and still spread pretty thin. Inside Neptune there are lots of planets and asteroids and more flattening of orbits to conform with Sol's rotation. Outside Neptune space is vast and empty. There *could* be uncharted planets. Singularities to swallow ships."

Ausfaller was indignant. "But for three to move into main trade lanes simultaneously?"

"It's not impossible, Sigmund."

"The probability—"

"Infinitesimal, right. Bey, it's damn near impossible. Any sane man would assume pirates."

It had been a long time since I had seen Sharrol. I was sorely tempted. "Ausfaller, have you traced the sale of any of the loot? Have you gotten any ransom notes?" *Convince me!*

Ausfaller threw back his head and laughed.

"What's funny?"

"We have hundreds of ransom notes. Any mental deficient can write a ransom note, and these disappearances have had a good deal of publicity. The demands were all fakes. I wish one or another had been genuine. A son of the Patriarch of Kzin was aboard *Wayfarer* when she disappeared. As for loot—hm-m-m. There has been a fall in the black market prices of boosterspice and gem woods. Otherwise—" He shrugged. "There has been no sign of the Barr originals or the Midas Rock or any of the more conspicuous treasures aboard the missing ships."

"Then you don't know one way or another."

"No. Will you go with us?"

"I haven't decided yet. When are you leaving?"

They'd be taking off tomorrow morning from the East End. That gave me time to make up my mind.

After dinner I went back to my room, feeling depressed. Carlos was going, that was clear enough. Hardly my fault . . . but he was here on Jinx because he'd done me and Sharrol a large favor. If he was killed going home . . .

A tape from Sharrol was waiting in my room. There were pictures of

the children, Tanya and Louis, and shots of the apartment she'd found us in the Twin Peaks arcology, and much more.

I ran through it three times. Then I called Ausfaller's room. It had been just too futzy long.

I circled Jinx once on the way out. I've always done that, even back when I was flying for Nakamura Lines; and no passenger has ever objected.

Jinx is the close moon of a gas giant planet more massive than Jupiter, and smaller than Jupiter because its core has been compressed to degenerate matter. A billion years ago Jinx and Primary were even closer, before tidal force moved them apart. This same tidal force had earlier locked Jinx's rotation to Primary and forced the moon into an egg shape, a prolate spheroid. When the moon moved outward its shape became more spherical; but the cold rock surface resisted change.

That is why the ocean of Jinx rings its waist, beneath an atmosphere too compressed and too hot to breathe; whereas the points nearest to and farthest from Primary, the East and West Ends, actually rise out of the atmosphere.

From space Jinx looks like God's Own Easter Egg; the Ends bone white tinged with yellow; then the brighter glare from rings of glittering ice fields at the limits of the atmosphere; then the varying blues of an Earthlike world, increasingly overlaid with the white frosting of cloud as the eyes move inward, until the waist of the planet/moon is girdled with pure white. The ocean never shows at all.

I took us once around, and out.

Sirius has its own share of floating miscellaneous matter cluttering the path to interstellar space. I stayed at the controls for most of five days, for that reason and because I wanted to get the feel of an unfamiliar ship.

Hobo Kelly was a belly-landing job, three hundred feet long, of triangular cross-section. Beneath an uptilted, forward-thrusting nose were big clamshell doors for cargo. She had adequate belly jets and a much larger fusion motor at the tail, and a line of windows indicating cabins. Certainly she looked harmless enough; and certainly there was deception involved. The cabin should have held forty or fifty, but there was only room for four. The rest of what should have been cabin space was windows with holograph projections in them.

The drive ran sure and smooth up to a maximum at ten gravities: not a lot for a ship designed to haul massive cargo. The cabin gravity held without putting out more than a fraction of its power. When Jinx and Primary were invisible against the stars, when Sirius was so distant I could look directly at it, I turned to the hidden control

panel Ausfaller had unlocked for me. Ausfaller woke up, found me doing that, and began showing me which did what.

He had a big X-ray laser and some smaller laser cannon set for different frequencies. He had four self-guided fusion bombs. He had a telescope so good that the ostensible ship's telescope was only a finder for it. He had deep-radar.

And none of it showed beyond the discolored hull.

Ausfaller was armed for bandarsnatchi. I felt mixed emotions. It seemed we could fight anything, and run from it too. But what kind of enemy was he expecting?

All through those four weeks in hyperdrive, while we drove through the Blind Spot at three days to the light-year, the topic of the ship-eaters reared its disturbing head.

Oh, we spoke of other things: of music and art, and of the latest techniques in animation, the computer programs that let you make your own holo flicks almost for lunch money. We told stories. I told Carlos why the kdatlyno Lloobee had made busts of me and Emil Horne. I spoke of the only time the Pierson's puppeteers had ever paid off the guarantee on a General Products hull, after the supposedly indestructible hull had been destroyed by antimatter. Ausfaller had some good ones . . . a lot more stories than he was allowed to tell, I gathered, from the way he had to search his memory every time.

But we kept coming back to the ship-eaters.

"It boils down to three possibilities," I decided. "Kzinti, puppeteers, or humans."

Carlos guffawed. "Puppeteers? Puppeteers wouldn't have the guts!"

"I threw them in because they might have some interest in manipulating the interstellar stock market. Look: our hypothetical pirates have set up an embargo, cutting Sol System off from the outside world. The puppeteers have the capital to take advantage of what that does to the market. And they need money. For their migration."

"The puppeteers are philosophical cowards."

"That's right. They wouldn't risk robbing the ships, or coming anywhere near them. Suppose they can make them disappear from a distance?"

Carlos wasn't laughing now. "That's easier than dropping them out of hyperspace to rob them. It wouldn't take more than a great big gravity generator . . . and we've never known the limits of puppeteer technology."

Ausfaller asked, "You think this is possible?"

"Just barely. The same goes for the Kzinti. The Kzinti are ferocious enough. Trouble is, if we ever learned they were preying on our

ships we'd raise pluperfect hell. The Kzinti know that, and they know we can beat them. Took them long enough, but they learned."

"So you think it's humans," said Carlos.

"Yah. If it's pirates."

The piracy theory still looked shaky. Spectrum telescopes had not even found concentrations of ship's metals in the space where they must have vanished. Would pirates steal the whole ship? If the hyperdrive motor were still intact after the attack, the rifled ship could be launched into infinity; but could pirates count on that happening eight times out of eight?

And none of the missing ships had called for help via hyperwave.

I'd never believed in pirates. Space pirates have existed, but they died without successors. Intercepting a spacecraft was too difficult. They couldn't make it pay.

Ships fly themselves in hyperdrive. All a pilot need do is watch for radial green lines in the mass sensor. But he has to do that frequently, because the mass sensor is a psionics device; it must be watched by a mind, not another machine.

As the narrow green line that marked Sol grew longer, I became abnormally conscious of the debris around Sol System. I spent the last twelve hours of the flight at the controls, chain-smoking with my feet. I should add that I do that normally, when I want both hands free; but now I did it to annoy Ausfaller. I'd seen the way his eyes bugged the first time he saw me take a drag from a cigarette between my feet. Flatlanders are less than limber.

Carlos and Ausfaller shared the control room with me as we penetrated Sol's cometary halo. They were relieved to be nearing the end of a long trip. I was nervous. "Carlos, just how large a mass would it take to make us disappear?"

"Planet size, Mars and up. Beyond that it depends on how close you get and how dense it is. If it's dense enough it can be less massive and still flip you out of the universe. But you'd see it in the mass sensor."

"Only for an instant . . . and not then, if it's turned off. What if someone turned on a giant gravity generator as we went past?"

"For what? They couldn't rob the ship. Where's their profit?"

"Stocks."

But Ausfaller was shaking his head. "The expense of such an operation would be enormous. No group of pirates would have enough additional capital on hand to make it worthwhile. Of the puppeteers I might believe it."

Hell, he was right. No human that wealthy would need to turn pirate.

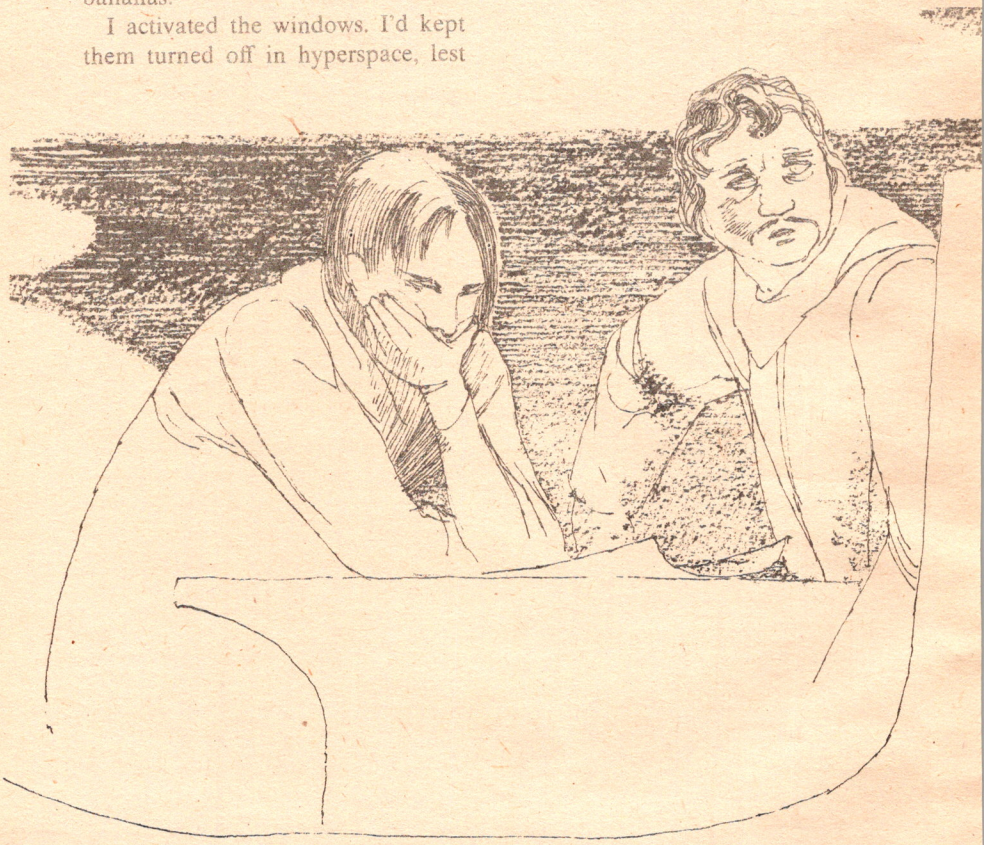
The long green line marking Sol

was almost touching the surface of the mass sensor. I said, "Breakout in ten minutes."

And the ship lurched savagely.

"Strap down!" I yelled, and glanced at the hyperdrive monitors. The motor was drawing no power, and the rest of the dials were going bananas.

I activated the windows. I'd kept them turned off in hyperspace, lest



my flatlander passengers go mad watching the Blind Spot. The screens came on and I saw stars. We were in normal space.

"Futz! They got us anyway." Carlos sounded neither frightened nor angry, but awed.

As I raised the hidden panel Ausfaller cried, "Wait!" I ignored him. I threw the red switch, and *Hobo Kelly* lurched again as her belly blew off.

Ausfaller began cursing in some dead flatlander language.

Now two-thirds of *Hobo Kelly* receded, slowly turning. What was left must show as what she was: a number-two General Products hull, puppeteer-built, a slender transparent spear three hundred feet long and twenty feet wide, with instruments of war clustered along what was now her belly. Screens that had been blank came to life. And I lit the main drive and ran it up to full power.

Ausfaller spoke in rage and venom. "Shaeffer, you idiot, you coward! We run without knowing what we run from. Now they know exactly what we are. What chance that they will follow us now? This ship was built for a specific purpose, and you have ruined it!"

"I've freed your special instruments," I pointed out. "Why don't you see what you can find?" Meanwhile I could get us the futz out of there.

Ausfaller became very busy. I watched what he was getting on screens at my side of the control panel. Was anything chasing us? They'd find us hard to catch and harder to digest. They could hardly have been expecting a General Products hull. Since the puppeteers stopped making them the price of used GP hulls has gone out of sight.

There *were* ships out there. Ausfaller got a closeup of them: three space tugs of the Belter type, shaped like thick saucers, equipped with oversized drives and powerful electromagnetic generators. Belters use them to tug nickel-iron asteroids to where somebody wants the ore. With those heavy drives they could probably catch us; but would they have adequate cabin gravity?

They weren't trying. They seemed to be neither following nor fleeing. And they looked harmless enough.

But Ausfaller was doing a job on them with his other instruments. I approved. *Hobo Kelly* had looked peaceful enough a moment ago. Now her belly bristled with weaponry. The tugs could be equally deceptive.

From behind me Carlos asked, "Bey? What happened?"

"How the futz would I know?"

"What do the instruments show?"

He must mean the hyperdrive complex. A couple of the indicators had gone wild; five more were dead. I said so. "And the drive's drawing no power at all. I've never

heard of anything like this. Carlos, it's *still* theoretically impossible."

"I'm . . . not so sure of that. I want a look at the drive."

"The access tubes don't have cabin gravity."

Ausfaller had abandoned the receding tugs. He'd found what looked to be a large comet, a ball of frozen gases a good distance to the side. I watched as he ran the deep-radar over it. No fleet of robber ships lurked behind it.

I asked, "Did you deep-radar the tugs?"

"Of course. We can examine the tapes in detail later. I saw nothing. And nothing has attacked us since we left hyperspace."

I'd been driving us in a random direction. Now I turned us toward Sol, the brightest star in the heavens. Those lost ten minutes in hyperspace would add about three days to our voyage.

"If there was an enemy, you frightened him away. Shaeffer, this mission and this ship have cost my department an enormous sum, and we have learned nothing at all."

"Not quite nothing," said Carlos. "I still want to see the hyperdrive motor. Bey, would you run us down to one G?"

"Yah. But . . . miracles make me nervous, Carlos."

"Join the club."

We crawled along an access tube just a little bigger than a big man's shoulders, between the hyperdrive motor housing and the surrounding fuel tankage. Carlos reached an inspection window. He looked in. He started to laugh.

I inquired as to what was so futzy funny.

Still chortling, Carlos moved on. I crawled after him and looked in.

There was no hyperdrive motor in the hyperdrive motor housing.

I went in through a repair hatch and stood in the cylindrical housing, looking about me. Nothing. Not even an exit hole. The superconducting cables and the mounts for the motor had been sheared so cleanly that the cut ends looked like little mirrors.

Ausfaller insisted on seeing for himself. Carlos and I waited in the control room. For a while Carlos kept bursting into fits of giggles. Then he got a dreamy, faraway look that was even more annoying.

I wondered what was going on in his head, and reached the uncomfortable conclusion that I could never know. Some years ago I took IQ tests, hoping to get a parenthood license that way. I am not a genius.

I knew only that Carlos had thought of something I hadn't, and he wasn't telling, and I was too proud to ask.

Ausfaller had no pride. He came back looking like he'd seen a ghost. "Gone! Where could it go? How could it happen?"

"That I can answer," Carlos said happily. "It takes an extremely

high gravity gradient. The motor hit that, wrapped space around itself and took off at some higher level of hyperdrive, one we can't reach. By now it could be well on its way to the edge of the universe."

I said, "You're sure, huh? An hour ago there wasn't a theory to cover any of this."

"Well, I'm sure our motor's gone. Beyond that it gets a little hazy. But this is one well-established model of what happens when a ship hits a singularity. At a lower gravity gradient the motor would take the whole ship with it, then strew atoms of the ship along its path till there was nothing left but the hyperdrive field itself."

"Ugh."

Now Carlos burned with the love of an idea. "Sigmund, I want to use your hyperwave. I could still be wrong, but there are things we can check."

"If we are still within the singularity of some mass, the hyperwave will destroy itself."

"Yah. I think it's worth the risk."

We'd dropped out, or been knocked out, ten minutes short of the singularity around Sol. That added up to sixteen light-hours of normal space, plus almost five hours from the edge of the singularity inward to Earth. Fortunately hyperwave is instantaneous, and every civilized system keeps a hyperwave relay station just outside the singularity. Southworth Station would relay our message inward by laser, get the return message the same way and pass it on to us ten hours later.

We turned on the hyperwave and nothing exploded.

Ausfaller made his own call first, to Ceres, to get the registry of the tugs we'd spotted. Afterward Carlos called Elephant's computer setup in New York, using a code number Elephant doesn't give to many people. "I'll pay him back later. Maybe with a story to go with it," he gloated.

I listened as Carlos outlined his needs. He wanted full records on a meteorite that had touched down in Tunguska, Siberia, USSR, Earth, in 1908 AD. He wanted a reprise on three models of the origin of the universe or lack of same: the Big Bang, the Cyclic Universe, the Steady State Universe. He wanted data on collapsars. He wanted names, career outlines, and addresses for the best known students of gravitational phenomena in Sol System. He was smiling when he clicked off.

I said, "You got me. I haven't the remotest idea what you're after."

Still smiling, Carlos got up and went to his cabin to catch some sleep.

I turned off the main thrust motor entirely. When we were deep in Sol System we could decelerate at thirty gravities. Meanwhile we were

carrying a hefty velocity picked up on our way out of Sirius System.

Ausfaller stayed in the control room. Maybe his motive was the same as mine. No police ships out here. We could still be attacked.

He spent the time going through his pictures of the three mining tugs. We didn't talk, but I watched.

The tugs seemed ordinary enough. Telescopic photos showed no suspicious breaks in the hulls, no hatches for guns. In the deep-radar scan they showed like ghosts: we could pick out the massive force field rings, the hollow, equally massive drive tubes, the lesser densities of fuel tank and life support system. There were no gaps or shadows that shouldn't have been there.

By and by Ausfaller said, "Do you know what *Hobo Kelly* was worth?"

I said I could make a close estimate.

"It was worth my career. I thought to destroy a pirate fleet with *Hobo Kelly*. But my pilot fled. Fled! What have I now, to show for my expensive Trojan Horse?"

I suppressed the obvious answer, along with the plea that my first responsibility was Carlos' life. Ausfaller wouldn't buy that. Instead, "Carlos has something. I know him. He knows how it happened."

"Can you get it out of him?"

"I don't know." I could put it to Carlos that we'd be safer if we knew what was out to get us. But Carlos was a flatlander. It would color his attitudes.

"So," said Ausfaller. "We have only the unavailable knowledge in Carlos' skull."

A weapon beyond human technology had knocked me out of hyperspace. I'd run. Of *course* I'd run. Staying in the neighborhood would have been insane, said I to myself, said I. But, unreasonably, I still felt bad about it.

To Ausfaller I said, "What about the mining tugs? I can't understand what they're doing out here. In the Belt they use them to move nickel-iron asteroids to industrial sites."

"It is the same here. Most of what they find is useless: stony masses or balls of ice; but what little metal there is is valuable. They must have it for building."

"For building what? What kind of people would live here? You might as well set up shop in interstellar space!"

"Precisely. There are no tourists, but there are research groups, here where space is flat and empty and temperatures are near absolute zero. I know that Quicksilver Group was established here to study hyperspace phenomena. We do not understand hyperspace, even yet. Remember that we did not invent the hyperdrive; we bought it from an alien race. Then there is a gene-tailoring laboratory trying to develop a kind of tree that will grow on comets."

"You're kidding."

"But they are serious. A photosynthetic plant to use the chemicals present in all comets . . . it would be very valuable. The whole cometary halo could be seeded with oxygen-producing plants—" Ausfaller stopped abruptly, then, "Never mind. But all these groups need building materials. It is cheaper to build out here than to ship everything from Earth or the Belt. The presence of tugs is not suspicious."

"But there was nothing else around us. Nothing at all."

Ausfaller nodded.

When Carlos came to join us many hours later, blinking sleep out of his eyes, I asked him. "Carlos, could the tugs have had anything to do with your theory?"

"I don't see how. I've got half an idea, and half an hour from now I could look like a half-wit. The theory I want isn't even in fashion any more. Now that we know what the quasars are, everyone seems to like the Steady State Hypothesis. You know how that works: the tension in completely empty space produces more hydrogen atoms, forever. The universe has no beginning and no end." He looked stubborn. "But if I'm right, then I know where the ships went after being robbed. That's more than anyone else knows."

Ausfaller jumped on him. "Where are they? Are the passengers alive?"

"I'm sorry, Sigmund. They're all dead. There won't even be bodies to bury."

"What is it? What are we fighting?"

"A gravitational effect. A sharp warping of space. A planet wouldn't do that, and a battery of cabin gravity generators wouldn't do it; they couldn't produce that sharply bounded a field."

"A collapsar," Ausfaller suggested.

Carlos grinned at him. "That would do it, but there are other problems. A collapsar can't even form at less than around five solar masses. You'd think someone would have noticed something that big, this close to Sol."

"Then *what?*"

Carlos shook his head. We would wait.

The relay from Southworth Station gave us registrations for three space tugs, used and of varying ages, all three purchased two years ago from IntraBelt Mining by the Sixth Congregational Church of Rodney.

"Rodney?"

But Carlos and Ausfaller were both chortling. "Belters do that sometimes," Carlos told me. "It's a way of saying it's nobody's business who's buying the ships."

"That's pretty funny, all right, but we still don't know who owns them."

"They may be honest Belters. They may not."

Hard on the heels of the first call

came the data Carlos had asked for, playing directly into the ship-board computer. Carlos called up a list of names and phone numbers: Sol System's pre-eminent students of gravity and its effects, listed in alphabetical order.

An Address caught my attention: *Julian Forward, #1192326 Southworth Station.*

A hyperwave relay tag. He was out *here,* somewhere in the enormous gap between Neptune's orbit and the cometary belt, out here where the hyperwave relay could function. I looked for more Southworth Station numbers. They were there: *Launcelot Starkey, 1844719 Southworth Station; Jill Luciano, 1844719 Southworth Station; Mariana Wilton, 1844719 Southworth Station.*

"These people," said Ausfaller. "You wish to discuss your theory with one of them?"

"That's right. Sigmund, isn't 1844719 the wavelength of the Quicksilver Group?"

"I think so. I also think that they are not within our reach, now that our hyperdrive is gone. The Quicksilver Group was established in distant orbit around Antenora, which is now on the other side of the Sun. Carlos, has it occurred to you that one of these people may have built the ship-eating device?"

"What? . . . You're right. It would take someone who knew something about gravity. But I'd say the Quicksilver Group was beyond suspicion. With upwards of ten thousand people at work, how could anyone hide anything?"

"What about this Julian Forward?"

"Forward. Yah. I've always wanted to meet him."

"You know of him? Who is he?"

"He used to be with the Institute of Knowledge on Jinx. I haven't heard of him in years. He did some work on the gravity waves from the galactic core . . . work that turned out to be wrong. Sigmund, let's give him a call."

"And ask him what?"

"Why . . . ?" Then Carlos remembered the situation. "Oh. You think he might—yah."

"How well do you know this man?"

"I know him by reputation. He's quite famous. I don't see how such a man could go in for mass murder."

"Earlier you said that we were looking for a man skilled in the study of gravitational phenomena."

"Granted."

Ausfaller sucked at his lower lip. Then, "Perhaps we can do more than talk to him. He could be on the other side of the Sun and still head a pirate fleet—"

"No. That he could not."

"Think again," said Ausfaller. "We are outside the singularity of Sol. A pirate fleet would surely include hyperdrive whips."

"If Julian Forward is the ship-eater, he'll have to be nearby. The,

uh, device won't move in hyperspace."

I said, "Carlos, what we don't know can kill us. Will you quit playing games—" But he was smiling, shaking his head. Futz. "All right, we can still check on Forward. Call him up and ask where he is! Is he likely to know you by reputation?"

"Sure. I'm famous too."

"OK. If he's close enough, we might even beg him for a ride home. The way things stand we'll be at the mercy of any hyperdrive ship for as long as we're out here."

"I hope we are attacked," said Ausfaller. "We can outfight—"

"But we can't outrun. They can dodge, we can't."

"Peace, you two. First things first." Carlos sat down at the hyperwave controls and tapped out a number.

Suddenly Ausfaller said, "Can you contrive to keep my name out of this exchange? If necessary you can be the ship's owner."

Carlos looked around in surprise. Before he could answer, the screen lit. I saw ash-blond hair cut in a Belter crest, over a lean white face and an impersonal smile.

"Forward Station. Good evening."

"Good evening. This is Carlos Wu of Earth calling long distance. May I speak to Dr. Julian Forward, please?"

"I'll see if he's available." The screen went on HOLD.

In the interval Carlos burst out: "What kind of game are *you* playing now? How can I explain owning an armed, disguised warship?"

But I began to see what Ausfaller was getting at. I said, "You'd want to avoid explaining that, whatever the truth was. Maybe he won't ask. I—" I shut up, because we were facing Forward.

Julian Forward was a Jinxian, short and wide, with arms as thick as legs and legs as thick as pillars. His skin was almost as black as his hair: a Sirius suntan, probably maintained by sunlights. He perched on the edge of a massage chair. "Carlos Wu!" he said with flattering enthusiasm. "Are you the same Carlos Wu who solved the Sealeyham Limits Problem?"

Carlos said he was. They went into a discussion of mathematics—a possible application of Carlos' solution to another limits problem, I gathered. I glanced at Ausfaller—not obtrusively, because for Forward he wasn't supposed to exist—and saw him pensively studying his side view of Forward.

"Well," Forward said, "what can I do for you?"

"Julian Forward, meet Beowulf Shaeffer," said Carlos. I bowed. "Bey was giving me a lift home when our hyperwave motor disappeared."

"Disappeared?"

I butted in, for verisimilitude. "Disappeared, futzy right. The hyperdrive motor casing is empty.

The motor supports are sheared off. We're stuck out here with no hyperdrive and no idea how it happened."

"Almost true," Carlos said happily. "Dr. Forward, I do have some ideas as to what happened here. I'd like to discuss them with you."

"Where are you now?"

I pulled our position and velocity from the computer and flashed them to Forward Station. I wasn't sure it was a good idea; but Ausfaller had time to stop me, and he didn't.

"Fine," said Forward's image. "It looks like you can get here a lot faster than you can get to Earth. Forward Station is ahead of you, within twenty a.u. of your position. You can wait here for the next ferry. Better than going on in a crippled ship."

"Good! We'll work out a course and let you know when to expect us."

"I welcome the chance to meet Carlos Wu." Forward gave us his own coordinates and rang off.

Carlos turned. "All right, Bey. Now *you* own an armed and disguised warship. *You* figure out where you got it."

"We've got worse problems than that. Forward Station is exactly where the ship-eater ought to be."

He nodded. But he was amused.

"So what's our next move? We can't run from hyperdrive ships. Not now. Is Forward likely to try to kill us?"

"If we don't reach Forward Station on schedule, he might send ships after us. We know too much. We've told him so," said Carlos. "The hyperdrive motor disappeared completely. I know half a dozen people who could figure out how it happened, knowing just that." He smiled suddenly. "That's assuming Forward's the ship-eater. We don't know that. I think we have a splendid chance to find out, one way or the other."

"How? Just walk in?"

Ausfaller was nodding approvingly. "Dr. Forward expects you and Carlos to enter his web unsuspecting, leaving an empty ship. I think we can prepare a few surprises for him. For example, he may not have guessed that this is a General Products hull. And I will be aboard to fight it."

True. Only antimatter could harm a GP hull . . . though things could go through it, like light and gravity and shock waves. "So you'll be in the indestructible hull," I said, "and we'll be helpless in the base. Very clever. I'd rather run for it, myself. But then, you have your career to consider."

"I will not deny it. But there are ways in which I can prepare you."

Behind Ausfaller's cabin, behind what looked like an unbroken wall, was a room the size of a walk-in closet. Ausfaller seemed quite proud of it. He didn't show us everything in there, but I saw enough

to cost me what remained of my first impression of Ausfaller. This man did not have the soul of a pudgy bureaucrat.

Behind a glass panel he kept a couple of dozen special purpose hand weapons. A row of four clamps held three identical hand weapons, disposable rocket launchers for a fat slug that Ausfaller billed as a tiny atomic bomb. The fourth clamp was empty. There were laser rifles and pistols; a shotgun of peculiar design, with four inches of recoil shock absorber; throwing knives; an Olympic target pistol with a sculpted grip and room for just one .22 bullet.

I wondered what he was doing with a hobbyist's touch-sculpting setup. Maybe he could make sculptures to drive a human or an alien mad. Maybe something less subtle: maybe they'd explode at the touch of the right fingerprints.

He had a compact automated tailor's shop. "I'm going to make you some new suits," he said. When Carlos asked why, he said, "You can keep secrets? So can I."

He asked us for our preference in styles. I played it straight, asking for a falling jumper in green and silver, with lots of pockets. It wasn't the best I've ever owned, but it fitted.

"I didn't ask for buttons," I told him.

"I hope you don't mind. Carlos, you will have buttons too."

Carlos chose a fiery red tunic with a green-and-gold dragon coiling across the back. The buttons carried his family monogram. Ausfaller stood before us, examining us in our new finery, with approval.

"Now, watch," he said. "Here I stand before you, unarmed—"

"Right."

"*Sure* you are."

Ausfaller grinned. He took the top and bottom buttons between his fingers and tugged hard. They came off. The material between them ripped open as if a thread had been strung between them.

Holding the buttons as if to keep an invisible thread taut, he moved them on either side of a crudely done plastic touch-sculpture. The sculpture fell apart.

"Sinclair molecule chain. It will cut through any normal matter, if you pull hard enough. You must be very careful. It will cut your fingers so easily that you will hardly notice they are gone. Notice that the buttons are large, to give an easy grip." He laid the buttons carefully on a table and set a heavy weight between them. "This third button down is a sonic grenade. Ten feet away it will kill. Thirty feet away it will stun."

I said, "Don't demonstrate."

"You may want to practice throwing dummy buttons at a target. This second button is Power Pill, the commercial stimulant. Break the button and take half when you need it. The entire dose may stop your heart."

"I never heard of Power Pill. How does it work on crash-landers?"

He was taken aback. "I don't know. Perhaps you had better restrict yourself to a quarter dose."

"Or avoid it entirely," I said.

"There is one more thing I will not demonstrate. Feel the material of your garments. You feel three layers of material? The middle layer is a nearly perfect mirror. It will reflect even X-rays. Now you can repel a laser blast, for at least the first second. The collar unrolls to a hood."

Carlos was nodding in satisfaction.

I guess it's true: all flatlanders think that way.

For a billion and a half years, humanity's ancestors have evolved to the conditions of one world: Earth. A flatlander grows up in an environment peculiarly suited to him. Instinctively he sees the whole universe the same way.

We know better, we who were born on other worlds. On We Made It there are the hellish winds of summer and winter. On Jinx, the gravity. On Plateau, the all-encircling cliff edge, and a drop of forty miles into unbearable heat and pressure. On Down, the red sunlight, and plants that will not grow without help from ultraviolet lamps.

But flatlanders think the universe was made for their benefit. To them, danger is unreal.

"Ear plugs," said Ausfaller, holding up a handful of soft plastic cylinders.

We inserted them. Ausfaller said, "Can you hear me?"

"Sure." They didn't block our hearing at all.

"Transmitter and hearing aid, with sonic padding between. If you are blasted with sound, as by an explosion or a sonic stunner, the hearing aid will stop transmitting. If you go suddenly deaf you will know you are under attack."

To me, Ausfaller's elaborate precautions only spoke of what we might be walking into. I said nothing. If we ran for it our chances were even worse.

Back to the control room, where Ausfaller set up a relay to the Alien Affairs Bureau on Earth. He gave them a condensed version of what had happened to us, plus some cautious speculation. He invited Carlos to read his theories into the record.

Carlos declined. "I could still be wrong. Give me a chance to do some studying."

Ausfaller went grumpily to his bunk. He had been up too long, and it showed.

Carlos shook his head as Ausfaller disappeared into his cabin. "Paranoia. In his job I guess he has to be paranoid."

"You could use some of that yourself."

He didn't hear me. "Imagine sus-

pecting an interstellar celebrity of being a space pirate!"

"He's in the right place at the right time."

"Hey, Bey, forget what I said. The, uh, ship-eating device has to be in the right place, but the pirates don't. They can just leave it loose and use hyperdrive ships to commute to their base."

That was something to keep in mind. Compared to the inner system this volume within the cometary halo was enormous; but to hyperdrive ships it was all one neighborhood. I said, "Then why are we visiting Forward?"

"I still want to check my ideas with him. More than that: he probably knows the Head Ship-Eater, without knowing it's him. Probably we both know him. It took something of a cosmologist to find the device and recognize it. Whoever it is, he has to have made something of a name for himself."

" 'Find'?"

Carlos grinned at me. "Never mind. Have you thought of anyone you'd like to use that magic wire on?"

"I've been making a list. You're at the top."

"Well, watch it. Sigmund knows you've got it, even if nobody else does."

"He's second."

"How long till we reach Forward Station?"

I'd been rechecking our course. We were decelerating at thirty gravities and veering to one side. "Twenty hours and a few minutes," I said.

"Good. I'll get a chance to do some studying." He began calling up data from the computer.

I asked permission to read over his shoulder. He gave it.

Bastard. He reads twice as fast as I do. I tried to skim, to get some idea of what he was after.

Collapsars: three known. The nearest was one component of a double in Cygnus, more than a hundred light-years away. Expeditions had gone there to drop probes.

The theory of the black hole wasn't new to me, though the math was over my head. If a star is massive enough, then after it has burned its nuclear fuel and started to cool, no possible internal force can hold it from collapsing inward past its own Schwarzschild radius. At that point the escape velocity from the star becomes greater than light-speed; and beyond that deponent saith not, because nothing can leave the star, not information, not matter, not radiation. Nothing—except gravity.

Such a collapsed star can be expected to weigh five solar masses or more; otherwise its collapse would stop at the neutron star stage. Afterward it can only grow bigger and more massive.

There wasn't the slightest chance of finding anything that massive out here at the edge of the Solar

System. If such a thing were anywhere near, the sun would have been in orbit around it.

The Siberia meteorite must have been weird enough, to be remembered for nine hundred years. It had knocked down trees over thousands of square miles; yet trees near the touchdown point were left standing. No part of the meteorite itself had ever been found. Nobody had seen it hit. In 1908, Tunguska, Siberia must have been as sparsely settled as the Earth's moon today.

"Carlos, what does all this have to do with anything?"

"Does Holmes tell Watson?"

I had real trouble following the cosmology. Physics verged on philosophy here, or vice versa. Basically the Big Bang Theory—which pictures the universe as exploding from a single point-mass, like a titanic bomb—was in competition with the Steady State Universe, which has been going on forever and will continue to do so. The Cyclic Universe is a succession of Big Bangs followed by contractions. There are variants on all of them.

When the quasars were first discovered, they seemed to date from an earlier stage in the evolution of the universe . . . which, by the Steady State hypothesis, would not be evolving at all. The Steady State went out of fashion. Then, a century ago, Hilbury had solved the mystery of the quasars. Meanwhile one of the implications of the Big Bang had not panned out. That was where the math got beyond me.

There was some discussion of whether the universe was open or closed in four-space, but Carlos turned it off. "OK," he said, with satisfaction.

"What?"

"I could be right. Insufficient data. I'll have to see what Forward thinks."

"I hope you both choke. I'm going to sleep."

Out here in the broad borderland between Sol System and interstellar space, Julian Forward had found a stony mass the size of a middling asteroid. From a distance it seemed untouched by technology: a lopsided spheroid, rough-surfaced and dirty white. Closer in, flecks of metal and bright paint showed like randomly placed jewels. Airlocks, windows, projecting antennae, and things less identifiable. A lighted disc with something projecting from the center: a long metal arm with half a dozen ball joints in it and a cup on the end. I studied that one, trying to guess what it might be . . . and gave up.

I brought *Hobo Kelly* to rest a fair distance away. To Ausfaller I said, "You'll stay aboard?"

"Of course. I will do nothing to disabuse Dr. Forward of the notion that the ship is empty."

We crossed to Forward Station on an open taxi: two seats, a fuel tank and a rocket motor. Once I

turned to ask Carlos something, and asked instead, "Carlos? Are you all right?"

His face was white and strained. "I'll make it."

"Did you try closing your eyes?"

"It was worse. Futz, I made it this far on hypnosis. Bey, it's so *empty.*"

"Hang on. We're almost there."

The blond Belter was outside one of the airlocks in a skin-tight suit and a bubble helmet. He used a flashlight to flag us down. We moored our taxi to a spur of rock—the gravity was almost nil—and went inside.

"I'm Harry Moskowitz," the Belter said. "They call me Angel. Dr. Forward is in the laboratory."

The interior of the asteroid was a network of straight cylindrical corridors, laser-drilled, pressurized and lined with cool blue light-strips. We weighed a few pounds near the surface, less in the deep interior. Angel moved in a fashion new to me: a flat jump from the floor that took him far down the corridor to brush the ceiling; push back to the floor and jump again. Three jumps and he'd wait, not hiding his amusement at our attempts to catch up.

"Dr. Forward asked me to give you a tour," he told us.

I said, "You seem to have a lot more corridor than you need. Why didn't you cluster all the rooms together?"

"This rock was a mine, once upon a time. The miners drilled these passages. They left big hollows wherever they found air-bearing rock or ice pockets. All we had to do was wall them off."

That explained why there was so much corridor between the doors, and why the chambers we saw were so big. Some rooms were storage areas, Angel said; not worth opening. Others were tool rooms, life-support systems, a garden, a fair-sized computer, a sizable fusion plant. A mess room built to hold thirty actually held about ten, all men, who looked at us curiously before they went back to eating. A hangar, bigger than need be and open to the sky, housed taxis and power suits with specialized tools, and three identical circular cradles, all empty.

I gambled. Carefully casual, I asked, "You use mining tugs?"

Angel didn't hesitate. "Sure. We can ship water and metals up from the inner system, but it's cheaper to hunt them down ourselves. In an emergency the tugs could probably get us back to the inner system."

We moved back into the tunnels. Angel said, "Speaking of ships, I don't think I've ever seen one like yours. Were those *bombs* lined up along the ventral surface?"

"Some of them," I said.

Carlos laughed. "Bey won't tell me how he got it."

"Pick, pick, pick. All right, I *stole* it. I don't think anyone is going to complain."

Angel, frankly curious before, was frankly fascinated as I told the story of how I had been hired to fly a cargo ship in the Wunderland system. "I didn't much like the looks of the guy who hired me, but what do I know about Wunderlanders? Besides, I needed the money." I told of my surprise at the proportions of the ship: the solid wall behind the cabin, the passenger section that was only holographs in blind portholes. By then I was already afraid that if I tried to back out I'd be made to disappear.

But when I learned my destination I got really worried. "It was in the Serpent Stream—you know, the crescent of asteroids in Wunderland System? It's common knowledge that the Free Wunderland Conspiracy is *all through* those rocks. When they gave me my course I just took off and aimed for Sirius."

"Strange they left you with a working hyperdrive."

"Man, they *didn't.* They'd ripped out the relays. I had to fix them myself. It's lucky I looked, because they had the relays wired to a little bomb under the control chair." I stopped, then, "Maybe I fixed it wrong. You heard what happened? My hyperdrive motor just plain vanished. It must have set off some explosive bolts, because the belly of the ship blew off. It was a dummy. What's left looks to be a pocket bomber."

"That's what I thought."

"I guess I'll have to turn it in to the goldskin cops when we reach the inner system. Pity."

Carlos was smiling and shaking his head. He covered by saying, "It only goes to prove that you *can* run away from your problems."

The next tunnel ended in a great hemispherical chamber, lidded by a bulging transparent dome. A man-thick pillar rose through the rock floor to a seal in the center of the dome. Above the seal, gleaming against night and stars, a multi-jointed metal arm reached out blindly into space. The arm ended in what might have been a tremendous iron puppy dish.

Forward was in a horseshoe-shaped control console near the pillar. I hardly noticed him at all. I'd seen this arm-and-bucket thing before, but I hadn't grasped its *size.*

Forward caught me gaping. "The Grabber," he said.

He approached us in a bouncing walk, comical but effective. "Pleased to meet you, Carlos Wu. Beowulf Shaeffer." His handshake was not crippling, because he was being careful. He had a wide, engaging smile. "The Grabber is our main exhibit here. After the Grabber there's nothing to see."

I asked, "What does it do?"

Carlos laughed. "It's beautiful! Why does it have to do anything?"

Forward acknowledged the compliment. "I've been thinking of entering it in a junk-sculpture show. What it does is manipulate large,

dense masses. The cradle at the end of the arm is a complex of electromagnets. I can actually vibrate masses in there to produce polarized gravity waves."

Six massive arcs of girder divided the dome into pie sections. Now I noticed that they and the seal at their center gleamed like mirrors. They were reinforced by stasis fields. More bracing for the Grabber? I tried to imagine forces that would require such strength.

"What do you vibrate in there? A megaton of lead?"

"Lead sheathed in soft iron was our test mass. But that was three years ago. I haven't worked with the Grabber lately, but we had some satisfactory runs with a sphere of neutronium enclosed in a stasis field. Ten billion metric tons."

I said, "What's the point?"

From Carlos I got a dirty look. Forward seemed to think it was a wholly reasonable question. "Communication, for one thing. There must be intelligent species all through the galaxy, most of them too far away for our ships. Gravity waves are probably the best way to reach them."

"Gravity waves travel at lightspeed, don't they? Wouldn't hyperwave be better?"

"We can't count on their having it. Who but the Outsiders would think to do their experimenting this far from a sun? If we want to reach beings who haven't dealt with the Outsiders, we'll have to use gravity waves . . . once we know how."

Angel offered us chairs and refreshments. By the time we were settled I was already out of it; Forward and Carlos were talking plasma physics, metaphysics, and what are our old friends doing? I gathered that they had large numbers of mutual acquaintances. And Carlos was probing for the whereabouts of cosmologists specializing in gravity physics.

A few were in the Quicksilver Group. Others were among the colony worlds . . . especially on Jinx, trying to get the Institute of Knowledge to finance various projects, such as more expeditions to the collapsar in Cygnus.

"Are you still with the Institute, Doctor?"

Forward shook his head. "They stopped backing me. Not enough results. But I can continue to use this station, which is Institute property. One day they'll sell it and we'll have to move."

"I was wondering why they sent you here in the first place," said Carlos. "Sirius has an adequate cometary belt."

"But Sol is the only system with any kind of civilization this far from its sun. And I can count on better men to work with. Sol System has always had its fair share of cosmologists."

"I thought you might have come to solve a old mystery. The Tung-

uska meteorite. You've heard of it, of course."

Forward laughed. "Of course. Who hasn't? I don't think we'll ever know just what it was that hit Siberia that night. It may have been a chunk of antimatter. I'm told that there is antimatter in known space."

"If it was, we'll never prove it," Carlos admitted.

"Shall we discuss your problem?" Forward seemed to remember my existence. "Shaeffer, what does a professional pilot think when his hyperdrive motor disappears?"

"He gets very upset."

"Any theories?"

I decided not to mention pirates. I wanted to see if Forward would mention them first. "Nobody seems to like my theory," I said, and I sketched out the argument for monsters in hyperspace.

Forward heard me out politely. Then, "I'll give you this, it'd be hard to disprove. Do you buy it?"

"I'm afraid to. I almost got myself killed once, looking for space monsters when I should have been looking for natural causes."

"Why would the hyperdrive monsters eat only your motor?"

"Um . . . futz. I pass."

"What do you think, Carlos? Natural phenomena or monsters?"

"Pirates," said Carlos.

"How are they going about it?"

"Well, this business of a hyperdrive motor disappearing and leaving the ship behind—that's brand new. I'd think it would take a sharp gravity gradient, with a tidal effect as strong as that of a neutron star or a black hole."

"You won't find anything like that anywhere in human space."

"I know." Carlos looked frustrated. That had to be faked. Earlier he'd behaved as if he already had an answer.

Forward said, "I don't think a black hole would have that effect anyway. If it did you'd never know it, because the ship would disappear down the black hole."

"What about a powerful gravity generator?"

"Hm-m-m." Forward thought about it, then shook his massive head. "You're talking about a surface gravity in the millions. Any gravity generator I've ever heard of would collapse itself at that level. Let's see, with a frame supported by stasis fields . . . no. The frame would hold and the rest of the machinery would flow like water."

"You don't leave much of my theory."

"Sorry."

Carlos ended a short pause by asking, "How do you think the universe started?"

Forward looked puzzled at the change of subject.

And I began to get uneasy.

Given all that I don't know about cosmology, I do know attitudes and tones of voice. Carlos was giving out broad hints, trying to lead Forward to his own con-

clusion. Black holes, pirates, the Tunguska meteorite, the origin of the universe—he was offering them as clues. And Forward was not responding correctly.

He was saying, "Ask a priest. Me, I lean toward the Big Bang. The Steady State always seemed so futile."

"I like the Big Bang too," said Carlos.

There was something else to worry about. Those mining tugs: they almost had to belong to Forward Station. How would Ausfaller react when three familiar spacecraft came cruising into his space?

How did I want him to react? Forward Station would make a dandy pirate base. Permeated by laser-drilled corridors distributed almost at random . . . could there be two networks of corridors, connected only at the surface? How would we know?

Suddenly I didn't want to know. I wanted to go home. If only Carlos would stay off the touchy subjects—

But he was speculating about the ship-eaters again. "That ten billion metric tons of neutronium, now, that you were using for a test mass. That wouldn't be big enough or dense enough to give us enough of a gravity gradient."

"It might, right near the surface." Forward grinned and held his hands close together. "It was about that big."

"And that's as dense as matter gets in this universe. Too bad."

"True, but . . . have you ever heard of quantum black holes?"

"Yah."

Forward stood up briskly. "Wrong answer."

I rolled out of my web chair, trying to brace myself for a jump, while my fingers fumbled for the third button on my jumper. It was no good. I hadn't practiced in this gravity.

Forward was in mid-leap. He slapped Carlos alongside the head as he went past. He caught me at the peak of his jump, and took me with him via an iron grip on my wrist.

I had no leverage, but I kicked at him. He didn't even try to stop me. It was like fighting a mountain. He gathered my wrists in one hand and towed me away.

Forward was busy. He sat within the horseshoe of his control console, talking. The backs of three disembodied heads showed above the console's edge.

Evidently there was a laser phone in the console. I could hear parts of what Forward was saying. He was ordering the pilots of the three mining tugs to destroy *Hobo Kelly*. He didn't seem to know about Ausfaller yet.

Forward was busy, but Angel was studying us thoughtfully, or unhappily, or both. Well he might. We could disappear, but what messages might we have sent earlier?

I couldn't do anything constructive with Angel watching me. And I couldn't count on Carlos.

I couldn't see Carlos. Forward and Angel had tied us to opposite sides of the central pillar, beneath the Grabber. Carlos hadn't made a sound since then. He might be dying from that tremendous slap across the head.

I tested the line around my wrists. Metal mesh of some kind, cool to the touch . . . and it was tight.

Forward turned a switch. The heads vanished. It was a moment before he spoke.

"You've put me in a very bad position."

And Carlos answered. "I think you put yourself there."

"That may be. You should not have let me guess what you knew."

Carlos said, "Sorry, Bey."

He sounded healthy. Good. "That's all right," I said. "But what's all the excitement about? What has Forward *got?*"

"I think he's got the Tunguska meteorite."

"No. That I do not." Forward stood and faced us. "I will admit that I came here to search for the Tunguska meteorite. I spent several years trying to trace its trajectory after it left Earth. Perhaps it *was* a quantum black hole. Perhaps not. The Institute cut off my funds, without warning, just as I had found a real quantum black hole, the first in history."

I said, "That doesn't tell me a lot."

"Patience, Mr. Shaeffer. You know that a black hole may form from the collapse of a massive star? Good. And you know that it takes a body of at least five solar masses. It may mass as much as a galaxy—or as much as the universe. There is some evidence that the universe is an infalling black hole. But at less than five solar masses the collapse would stop at the neutron star stage."

"I follow you."

"In all the history of the universe, there has been one moment at which smaller black holes might have formed. That moment was the explosion of the monoblock, the cosmic egg that once contained all of the matter in the universe. In the ferocity of that explosion there must have been loci of unimaginable pressure. Black holes could have formed of mass down to 2.2×10^{-5} grams, 1.6×10^{-25} Angstroms in radius."

"Of course you'd never detect anything that small," said Carlos. He seemed almost cheerful. I wondered why . . . and then I knew. He'd been right about the way the ships were disappearing. It must compensate him for being tied to a pillar.

"But," said Forward, "black holes of all sizes could have formed in that explosion, and should have. In more than seven hundred years of searching, no

quantum black hole has ever been found. Most cosmologists have given up on them, and on the Big Bang too."

Carlos said, "Of course there was the Tunguska meteorite. It could have been a black hole of, oh, asteroidal mass—"

"—and roughly molecular size. But the tide would have pulled down trees as it went past—"

"—and the black hole would have gone right through the Earth and headed back into space a few tons heavier. Eight hundred years ago there was actually a search for the exit point. With that they could have charted a course—"

'Exactly. But I had to give up that approach," said Forward. "I was using a new method when the Institute, ah, severed our relationship."

They must both be mad, I thought. Carlos was tied to a pillar and Forward was about to kill him, yet they were both behaving like members of a very exclusive club . . . to which I did not belong.

Carlos was interested. "How'd you work it?"

"You know that it is possible for an asteroid to capture a quantum black hole? In its interior? For instance, at a mass of 10^{12} kilograms—a billion metric tons," he added for my benefit, "a black hole would be only 1.5×10^{-5} Angstroms across. Smaller than an atom. In a slow pass through an asteroid it might absorb a few billions of atoms, enough to slow it into an orbit. Thereafter it might orbit within the asteroid for eons, absorbing very little mass on each pass."

"So?"

"If I chance on an asteroid more massive than it ought to be . . . and if I contrive to move it, and some of the mass stays behind . . ."

"You'd have to search a lot of asteroids. Why do it out here? Why not the asteroid belt? Oh, of course, you can use hyperdrive out here."

"Exactly. We could search a score of masses in a day, using very little fuel."

"Hey. If it was big enough to eat a spacecraft, why didn't it eat the asteroid you found it in?"

"It wasn't that big," said Forward. "The black hole I found was exactly as I have described it. I enlarged it. I towed it home and ran it into my neutronium sphere. *Then* it was large enough to absorb an asteroid. Now it is quite a massive object! 10^{20} kilograms, the mass of one of the larger asteroids, and a radius of just under 10^{-5} centimeters."

There was satisfaction in Forward's voice. In Carlos' there was suddenly nothing but contempt. "You accomplished all that, and then you used it to rob ships and bury the evidence. Is that what's going to happen to us? Down the rabbit hole?"

"To another universe, perhaps. Where does a black hole lead?"

I wondered about that myself.

Angel had taken Forward's place at the control console. He had fastened the seat belt, something I had not seen Forward do, and was dividing his attention between the instruments and the conversation.

"I'm still wondering how you move it," said Carlos. Then, "Uh! The tugs!"

Forward stared, then guffawed. "You didn't guess that? But of course the black hole can hold a charge. I played the exhaust from an old ion drive reaction motor into it for nearly a month. Now it holds an enormous charge. The tugs can pull it well enough. I wish I had more of them. Soon I will."

"Just a minute," I said. I'd grasped one crucial fact as it went past my head. "The tugs aren't armed? All they do is pull the black hole?"

"That's right." Forward looked at me curiously.

"And the black hole is invisible."

"Yes. We tug it into the path of a spacecraft. If the craft comes near enough it will precipitate into normal space. We guide the black hole through its drive to cripple it, board and rob it at our leisure. Then a slower pass with the quantum black hole, and the ship simply disappears."

"Just one last question," said Carlos. "Why?"

I had a better question.

Just what was Ausfaller going to do when three familiar spacecraft came near? They carried no armaments at all. Their only weapon was invisible.

And it would eat a General Products hull without noticing.

Would Ausfaller fire on unarmed ships?

We'd know, too soon. Up there near the edge of the dome, I had spotted three tiny lights in a tight cluster.

Angel had seen it too. He activated the phone. Phantom heads appeared, one, two, three.

I turned back to Forward, and was startled at the brooding hate in his expression.

"Fortune's child," he said to Carlos. "Natural aristocrat. Certified superman. Why would *you* ever consider stealing anything? Women beg you to give them children, in person if possible, by mail if not! Earth's resources exist to keep you healthy, not that you need them!"

"This may startle you," said Carlos, "but there are people who see *you* as a superman."

"We bred for strength, we Jinxians. At what cost to other factors? Our lives are short, even with the aid of boosterspice. Longer if we can live outside Jinx's gravity. But the people of other worlds think we're funny. The women . . . never mind." He brooded, then said it anyway. "A woman of Earth

once told me she would rather go to bed with a tunneling machine. She didn't trust my strength. What woman would?"

The three bright dots had nearly reached the center of the dome. I saw nothing between them. I hadn't expected to. Angel was still talking to the pilots.

Up from the edge of the dome came something I didn't want anyone to notice. I said, "Is that your excuse for mass murder, Forward? Lack of women?"

"I need give you no excuses at all, Shaeffer. My world will thank me for what I've done. Earth has swallowed the lion's share of the interstellar trade for too long."

"They'll thank you, huh? You're going to tell them?."

"I—"

"Julian!" That was Angel calling. He'd seen it . . . no, he hadn't. One of the tug captains had.

Forward left us abruptly. He consulted with Angel in low tones, then turned back. "Carlos! Did you leave your ship on automatic? Or is there someone else aboard?"

"I'm not required to say," said Carlos.

"I could—no. In a minute it will not matter."

Angel said, "Julian, look what he's doing."

"Yes. Very clever. Only a human pilot would think of that."

Ausfaller had maneuvered the *Hobo Kelly* between us and the tugs. If the tugs fired a conventional weapon, they'd blast the dome and kill us all.

The tugs came on.

"He still does not know what he is fighting," Forward said with some satisfaction.

True, and it would cost him. Three unarmed tugs were coming down Ausfaller's throat, carrying a weapon so slow that the tugs could throw it at him, let it absorb *Hobo Kelly*, and pick it up again long before it was a danger to us.

From my viewpoint *Hobo Kelly* was a bright point with three dimmer, more distant points around it. Forward and Angel were getting a better view, through the phone. They weren't watching us at all.

I began trying to kick off my shoes. They were soft ship-slippers, ankle-high, and they resisted.

I kicked the left foot free just as one of the tugs flared with ruby light.

"He did it!" Carlos didn't know whether to be jubilant or horrified. "He fired on unarmed ships!"

Forward gestured peremptorily. Angel slid out of his seat. Forward slid in and fastened the thick seat belt. Neither had spoken a word.

A second ship burned fiercely red, then expanded in a pink cloud.

The third ship was fleeing.

Forward worked the controls. "I have it in the mass indicator," he rasped. "We have but one chance."

So did I. I peeled the other slipper off with my toes.

Over our heads the jointed arm

of the Grabber began to swing . . . and I suddenly realized what they were talking about.

Now there was little to see beyond the dome. The swinging Grabber, and the light of *Hobo Kelly*'s drive, and the two tumbling wrecks, all against a background of fixed stars. Suddenly one of the tugs winked blue-white and was gone. Not even a dust cloud was left behind.

Ausfaller must have seen it. He was turning, fleeing. Then it was as if an invisible hand had picked up *Hobo Kelly* and thrown her away. The fusion light streaked off to one side and set beyond the dome's edge.

With two tugs destroyed and the third fleeing, the black hole was falling free, aimed straight down our throats.

Now there was nothing to see but the delicate motions of the Grabber. Angel stood behind Forward's chair, his knuckles white with his grip on the chair's back.

My few pounds of weight went away and left me in free fall. Tides again. The invisible thing was more massive than this asteroid beneath me. The Grabber swung a meter more to one side . . . and something struck it a mighty blow.

The floor surged away from beneath me, left me head down above the Grabber. The huge soft-iron puppy dish came at me; the jointed metal arm collapsed like a spring. It slowed, stopped.

"You got it!" Angel crowed like a rooster and slapped at the back of the chair, holding himself down with his other hand. He turned a gloating look on us, turned back just as suddenly. "The ship! It's getting away!"

"No." Forward was bent over the console. "I see him. Good, he is coming back, straight toward us. This time there will be no tugs to warn the pilot."

The Grabber swung ponderously toward the point where I'd seen *Hobo Kelly* disappear.It moved centimeters at a time, pulling a massive invisible weight.

And Ausfaller was coming back to rescue us. He'd be a sitting duck, unless—

I reached up with my toes, groping for the first and fourth buttons on my falling jumper.

The weaponry in my wonderful suit hadn't helped me against Jinxian strength and speed. But flatlanders are less than limber, and so are Jinxians. Forward had tied my hands and left it at that.

I wrapped two sets of toes around the buttons and tugged.

My legs were bent pretzel-fashion. I had no leverage. But the first button tore loose, and then the thread. Another invisible weapon to battle Forward's portable bottomless hole.

The thread pulled the fourth button loose. I brought my feet down to where they belonged, keeping the thread taut, and pushed back-

ward. I felt the Sinclair molecule chain sinking into the pillar.

The Grabber was still swinging.

When the thread was through the pillar I could bring it up in back of me and try to cut my bonds. More likely I'd cut my wrists and bleed to death; but I had to try. I wondered if I could do anything before Forward launched the black hole.

A cold breeze caressed my feet.

I looked down. Thick fog boiled out around the pillar.

Some very cold gas must be spraying through the hair-fine crack.

I kept pushing. More fog formed. The cold was numbing. I felt the jerk as the magic thread cut through. Now the wrists—

Liquid helium?

Forward had moored us to the main superconducting power cable.

That was probably a mistake. I pulled my feet forward, carefully, steadily, feeling the thread bite through on the return cut.

The Grabber had stopped swinging. Now it moved on its arm like a blind, questing worm, as Forward made fine adjustments. Angel was beginning to show the strain of holding himself upside down.

My feet jerked slightly. I was through. My feet were terribly cold, almost without sensation. I let the buttons go, left them floating up toward the dome, and kicked back hard with my heels.

Something shifted. I kicked again.

Thunder and lightning flared around my feet.

I jerked my knees up to my chin. The lightning crackled and flashed white light into the billowing fog. Angel and Forward turned in astonishment. I laughed at them, letting them see it. Yes, gentlemen, I did it on purpose.

The lightning stopped. In the sudden silence Forward was screaming, "—Know what you've *done?*"

There was a grinding *crunch*, a shuddering against my back. I looked up.

A piece had been bitten out of the Grabber.

I was upside down and getting heavier. Angel suddenly pivoted around his grip on Forward's chair. He hung above the dome, above the sky. He screamed.

My legs gripped the pillar hard. I felt Carlos' feet fumbling for a foothold, and heard him laugh.

Near the edge of the dome a spear of light was rising. *Hobo Kelly*'s drive, decelerating, growing larger. Otherwise the sky was clear and empty. And a piece of the dome disappeared with a snapping sound.

Angel screamed and dropped. Just above the dome he seemed to flare with blue light.

He was gone.

Air roared out through the dome—and more was disappearing into something that had been invisible. Now it showed as a blue pin-

point drifting toward the floor. Forward had turned to watch it fall.

Loose objects fell across the chamber, looped around the pinpoint at meteor speed or fell into it with bursts of light. Every atom of my body felt the pull of the thing, the urge to die in an infinite fall. Now we hung side by side from a horizontal pillar. I noted with approval that Carlos' mouth was wide open, like mine, to clear his lungs so that they wouldn't burst when the air was gone.

Daggers in my ears and sinuses, pressure in my gut.

Forward turned back to the controls. He moved one knob hard over. Then—he opened the seat belt and stepped out and up, and fell.

Light flared. He was gone.

The lightning-colored pinpoint drifted to the floor, and into it. Above the increasing roar of air I could hear the grumbling of rock being pulverized, dwindling as the black hole settled toward the center of the asteroid.

The air was deadly thin, but not gone. My lungs thought they were gasping vacuum. But my blood was not boiling. I'd have known it.

So I gasped, and kept gasping. It was all I had attention for. Black spots flickered before my eyes, but I was still gasping and alive when Ausfaller reached us carrying a clear plastic package and an enormous handgun.

He came in fast, on a rocket backpack. Even as he decelerated he was looking around for something to shoot. He returned in a loop of fire. He studied us through his faceplate, possibly wondering if we were dead.

He flipped the plastic package open. It was a thin sack with a zipper and a small tank attached. He had to dig for a torch to cut our bonds. He freed Carlos first, helped him into the sack. Carlos bled from the nose and ears. He was barely mobile. So was I, but Ausfaller got me into the sack with Carlos and zipped it up. Air hissed in around us.

I wondered what came next. As an inflated sphere the rescue bag was too big for the tunnels. Ausfaller had thought of that. He fired at the dome, blasted a gaping hole in it, and flew us out on the rocket backpack.

Hobo Kelly was grounded nearby. I saw that the rescue bag wouldn't fit the airlock either . . . and Ausfaller confirmed my worst fear. He signaled us by opening his mouth wide. Then he zipped open the rescue bag and half-carried us into the airlock while the air was still roaring out of our lungs.

When there was air again Carlos whispered, "Please don't do that any more."

"It should not be necessary any more." Ausfaller smiled. "Whatever it was you did, well done. I have two well-equipped autodocs to repair you. While you are healing, I

will see about recovering the treasure within the asteroid."

Carlos held up a hand, but no sound came. He looked like something risen from the dead: blood running from nose and ears, mouth wide open, one feeble hand raised against gravity.

"One thing," Ausfaller said briskly. "I saw many dead men; I saw no living ones. How many were there? Am I likely to meet opposition while searching?"

"Forget it," Carlos croaked. "Get us out of here. Now."

Ausfaller frowned. "What—"

"No time. Get us out."

Ausfaller tasted something sour. "Very well. First, the autodocs." He turned, but Carlos' strengthless hand stopped him.

"Futz, no. I want to see this," Carlos whispered.

Again Ausfaller gave in. He trotted off to the control room. Carlos tottered after him. I tottered after them both, wiping blood from my nose, feeling half dead myself. But I'd half-guessed what Carlos expected. I didn't want to miss it.

We strapped down. Ausfaller fired the main thruster. The rock surged away.

"Far enough," Carlos whispered presently. "Turn us around."

Ausfaller took care of that. Then, "What are we looking for?"

"You'll know."

"Carlos, was I right to fire on the tugs?"

"Oh, yes."

"Good. I was worried. Then Forward was the ship-eater?"

"Yah."

"I did not see him when I came for you. Where is he?"

Ausfaller was annoyed when Carlos laughed, and more annoyed when I joined him. It hurt my throat. "Even so, he saved our lives," I said. "He must have turned up the air pressure just before he jumped. I wonder why he did that?"

"Wanted to be remembered," said Carlos. "Nobody else knew what he'd done. *Ahh*—"

I looked, just as part of the asteroid collapsed into itself, leaving a deep crater.

"It moves slower at apogee. Picks up more matter," said Carlos.

"What *are* you talking about?"

"Later, Sigmund. When my throat grows back."

"Forward had a hole in his pocket," I said helpfully. "He—"

The other side of the asteroid collapsed. For a moment lightning seemed to flare in there.

Then the whole dirty snowball was growing smaller.

I thought of something Carlos had probably missed. "Sigmund, has this ship got automatic sunscreens?"

"Of *course* we've got—"

There was a universe-eating flash of light before the screen went black. When the screen cleared there was nothing to see but stars. ■

the present state of
igneos research

In keeping with our policy of reporting on dragons, and in the spirit of the season . . .

Research—serious research, that is—into the subject of the large *igneo-eructidae* known familiarly to scholars in the field as "igneos" and to the layman as "dragons," has always been hampered as much by lack of a place to publish results as by the general skepticism of the public—to say nothing of the skepticism of most present-day biologists and zoologists—concerning the existence of this species.

The effect of this has been that efforts to publish in the field have produced activities on the part of the researcher more resembling those of the hero in a late-night spy movie than those of someone engaged in ordinary scholarly investigation. Occasionally, of course, this unorthodox behavior has paid unexpected dividends, as in the discovery of new channels of information, such as the publication in which you are now reading this monograph. True to a long-standing policy of barring nothing from its pages which might be of interest to its admittedly highly-selective readership, Analog has emerged as the one publication of the last several decades which has continuously striven to keep its readers up to date on the latest igneos research.

Occasionally, we must admit, this information has had to be presented in fictional form, even here. But I need not rehearse examples of excellent information on the igneos, reaching this publication's readers from highly qualified workers in the field such as Ann McCaffrey and Poul Anderson, to name only two. Having, however, cited this pair, who by their scholarship and renown are hardly in a position to be shaken by any ordinary attack, let us move along to the main topic. For the subject of this particular paper is not the conditions and problems surrounding igneos research, but a fortunate discovery of a piece of invaluable new evidence which bids fair to shine a powerful, valuable—if not revolutionary—light on the whole species.

This discovery consists of a manuscript that presents an account, in verse, of an encounter between an igneos and a human. It is not, however, merely the account of any random encounter, but details the exact

actions of a member of the "Dragon-Runners' Guild" toward one particular igneos, in accordance with the rules of that Guild. The Dragon-Runners' Guild is an organization, the existence of which has been long suspected by researchers into the igneos situation. Now, with this manuscript, proof has at last been obtained that the Guild did indeed exist—and may still, in fact, be not only in existence, but in active existence, even in our present era.

But more of that in a moment. Let us pass on to more solid matters. It is necessary before building conjecture upon fact to give a more precise description of the manuscript, and an account of the information to be deduced from it.

On first examination the narrative appears to be written in something very like Fourteenth Century Middle English. Closer scrutiny, however, reveals two puzzling inconsistencies. One, the chronicler who wrote it was clearly unused to the making of such chronicles. There are variances within the text that show that it was penned with a good deal of carelessness and little thought beyond that of setting down the immediate information it contained. Second, the language used, while it has some of the tricks of spelling common to Middle English in the period mentioned, also shows a meter and rhyme that is only consistent if the words set down are pronounced as a speaker of Modern English would pronounce them.

However, tests of the parchment on which the manuscript was written, and the ink used, have proved that neither parchment nor ink were of any more recent vintage than some five hundred years, and possibly much older. This has left only one possible conclusion, by anyone knowledgeable in the igneos field. That is, that while the manuscript had to be written by someone with a modern ear, it was nonetheless written by such a person while he or she was existing in the Fourteenth Century or earlier.

In short, we must assume that a case of temporal translation (i.e., time-traveling) was involved in the production of this manuscript.

Startling—even self-contradictory—as this may sound to those unacquainted with the work already done in this field, it is quite consistent with other evidence previously published. Those informed about the igneos will undoubtedly recall Ms. McCaffrey's references to, and descriptions of, the phenomenon of temporal translation as achieved by these remarkable creatures, in her earlier papers in this publication. It therefore becomes entirely conceivable that the author of this manuscript was originally of our own modern era.

Once this fact is accepted, the internal evidence of the manuscript delivers up that information which I have—and I believe justly—referred to

as revolutionary. For centuries researchers have puzzled over what actually extinguished the race of the igneos. Naturally, among knowledgeable scholars, the mistaken folk-tale notion that the igneos were evil creatures destroyed by human heroes—the "St. George and the Dragon" legend, for example—has long been recognized for the cruel distortion of fact that it is. I, myself, have had a few words to say on this matter in another publication, some seventeen years ago ("St. Dragon and the George," *Fantasy and Science Fiction,* September 1957); and the georgists, I am confident, are a dying breed. For some centuries we in the field have been convinced that igneos-nature was just the opposite of evil; although it is only for the first time, in this manuscript, that we have documentary proof of the fact—documentary proof provided by a human writer.

I refer you to stanza twenty-four, lines one and two, of the manuscript:

> "Ye whole world knowes—despyte hys fercer parte
> How ech Dragon wythin hathe noble herte . . ."

The important information here lies in the words ". . . hathe noble herte." As I say, anyone expert in the field has long suspected this to be true. But we must ask ourselves, since igneos were noble-hearted, and known by humans to be so, how did canards like the St. George and the Dragon legend get started?

I believe the answer to that can be given simply, in one word. Guilt. As internal evidence in this manuscript makes clear, humans were indeed responsible for the disappearance of the igneos from among us; but not by force of arms. Rather by neglect and inattention, a treatment these noble-hearted creatures could not endure.

As a careful examination of the manuscript will show, a close association between man and igneos was originally considered not merely advantageous, but necessary to the igneos. Observe that the story set down in these lines is that of an igneos revived from a poor state of health by a human. Lacking such human association previously, the igneos Shagoth, as it is noted near the beginning of the poem, has become "fatte" and "styffe," with a temper that "wasse notte gude." He has, in fact, become so debilitated as to lose his natural ability to fly.

Contrast this condition with the accounts of the same igneos, further on in the poem after he has been contacted and exercised by a comparably noble-hearted human—the Prentice (later Knight, still later Baron) Morlet:

> ". . . Above ye rockye strande and cruel sea,
> SHAGOTH bete upward, lyght as fethers bee;

Swoopynge and makynge Turnes Immeleman,
And Loope-ve-Loopes, all suche as Dragon canne . . ."

Note, also, how it is later remarked that the now-slim igneos continues to "ronne" and lift "hevie weightes to keepe hym trim" although Morlet, in person, has already parted with him. Above all, note the extremely important lines emphasizing that, as a result of Shagoth keeping up these activities, "all other Dragones envie hym . . ." (!)

To the trained professional eye, lines and line-fragments such as these fit together to make certain unmistakable statements. Shagoth is not just one igneos, left to lead a solitary existence—but all igneos in such condition of human neglect. Morlet is not merely one human, but representative of a whole class of humans who have always concerned themselves with the welfare of the igneos. And the message, in brief, is plain. Igneos require human contact and assistance for their existence in this world. A lack of such contact in recent centuries was obviously a primary reason for their disappearance from among us.

But is this sad conclusion all we can learn from this manuscript? No. There is further information to be gleaned from the lines of poetry; and this indicates almost beyond a shadow of a doubt that the igneos need not be gone from among us for good.

For, I submit humbly, but with the certainty of all my years of scholarship in this field, that these lines, together with other evidence I have mentioned, reveal that the igneos, as a race, have not died out. What they have done is to withdraw temporally from us humans. They have literally hidden themselves somewhere in the temporal continuum, using their ability to travel there.

Where in the temporal continuum are they hiding? The answer to this question must await further research. But no one of intelligence can doubt that the answer is there waiting for us. I submit to you two inescapable conclusions:

One, that this manuscript was clearly written by a modern hand.

Two, that the Dragon-Runners' Guild is proved beyond any reasonable doubt to exist.

The deduction from these conclusions is obvious. The writer of the manuscript must have been himself or herself a member of the Guild—a modern member who was able to return through time to the Fourteenth Century or earlier. Such temporal translations could only have been accomplished with the help of one or more igneos—which means that their race must still exist, in some area removed from our modern present, but from which they are in contact with the Guild. Such Guild-contact can only indicate that the igneos have not completely given up on humanity.

This being the case, however, we may well ask ourselves—can the igneos ever be brought back into contact with the rest of our race, and if so, how?

The poem itself offers an answer. It was the lack of association of noble-hearted humans that caused the igneos to disappear from view, it tells us. But it avoids suggesting that there were no longer any noble-hearted humans in existence. I propose, rather, that it was the noisy vehicles of modern transportation, the overwhelming growth of human cities—in short, the infestation of earth and sky with all the artifacts of what humans call modern civilization—that caused the sensitive igneos to shrink back more and more into isolated areas, where the possibility of their contact with the noble-hearted among our own race was extremely limited.

But now, we have finally come upon a practical means of bringing the igneos out of hiding. It is through such publications as this, that a sufficient number of igneos-minded humans can be located and identified; so that, finding human friends once more available to them, the igneos may possibly be enticed to return among us.

I have been told point-blank by other igneos experts that this prospect is a pipe-dream on my part; that the noble-hearted human is as extinct as the igneos themselves have popularly been believed to be. However, I emphatically reject such pessimism; and I offer to rebut it with the reactions of the readers of this monograph. Let me refer you to the fact that, at its conclusion, the manuscript shows Shagoth and Morlet, although they are now separated, maintaining their friendship through an exchange of correspondence once a year:

> ". . . Butte yn ye season whenne ye misteltoe
> And holly hangeth hevye on ye bough,
> Ech wrytes to ech a lettere of gude cheere,
> To telle hys friende whatte hym befel thatte yeare."

I stand on my belief that there are among the readers of this publication many of those noble-hearted individuals with whom our time-stranded igneos friends yearn to have contact. And I call on all of you reading this. How many of you would not be willing, like Morlet, to sit down once a year at this holiday season and pen a "lettere of gude cheere" to an igneos friend?

Confident that the positive response to this question will be an overwhelmingly decisive one, I sit back to await the future in an atmosphere of anticipation and high hope.

GORDON R. DICKSON

Ye Prentice and Ye Dragon

Yn frostye season whenne ye misteltoe
And holly hangeth hevye on ye bough;
A deede bothe brave and kindlie once befel;
The tale of whych yn truthe I canne nowe telle.

Ther wasse a Dragon, SHAGOTH, on a clyffe.
I wiss hee wasse a Dragon fatte and styffe;
For thatte since manye settynges of ye sunne
Hee hadde no ferce battaile, nor helthful ronne.

And as bothe Dragones and alle mankinde hathe,
Hys styffnesse fedeth fulle hys anciente wrathe.
By alle of whych I shulde be understoode
To saye of hym, hys temper wasse notte gude.

By cause of thys, hys sore infirmitee,
He sheweth no traveleres ne mercie;
Ande suche grym stories of hym didde resound,
Alle folke of hys clyffe passeth far around.

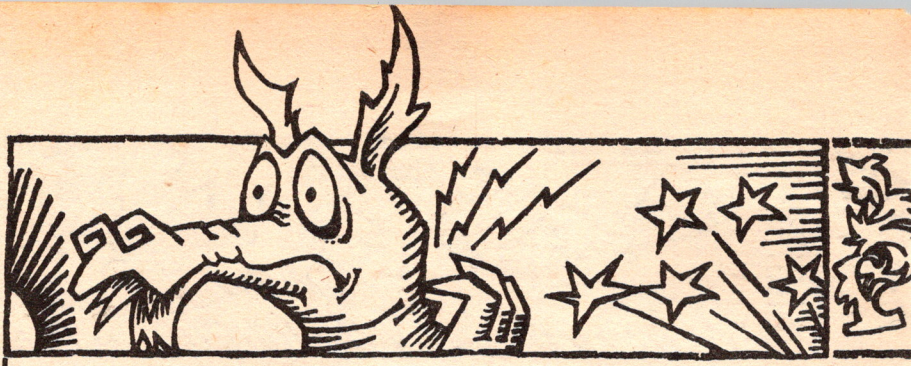
But at ye tyme of whych I nowe relate
Ther cameth one whose renoun wasse notte grete;
A Prentice onlie, but by stronge oathe bounde,
To ronne alle Dragones, and to keepe them sounde.

And as hys rank, tho gentil, wasse not grete,
Hee had no welth, ne any hy estate;
But that rare charitie to Dragonkinde
Whych Sages praiseth, tyme alle oute of mynde

MORLET, hys name, a brave and kindlie youth.
When thatte hee knew ye mattere wasse ynsoothe
Of a Dragon's deepe neede, yvowed thatte hee
Shulde see ye SHAGOTH ronninge lyssomlee.

Yet perille was ynough, as welle he wotte,
Sobye hee came at nyghttyme as ythought,
Wher slepeth SHAGOTH yn a rockye neste,
Groanynge for aches thatte paineth stronge hys reste.

And cleverlye ye Prentice, alle alone,
Beneathe ye necke of SHAGOTH rolled a stone.
So thatte ye Dragon twyst hys necke yn sleepe,
Ye stone from bruysing of his fleshe to keepe.



So slepeth hee wyth twysted necke tyll dawne,
Woke wyth ye sunne and sterteth up anon.
A styffe, and certes, a crookede necke to fynde,
Soe thatte he myghte bye no meanes looke behinde.

Soe payned thys laste condicioun, past beliefe,
Thatte SHAGOTH gan to wepe for verie griefe—
"O sadde a Dragon's lyfe," quod hee, "thatte I
Must suffere soe, and am too fatte to flye!"

But scarcelie hadde he made thys woefulle moan,
When hee did feele a poke at hys tayle-bone.
Furieuse, hee tryde to turn hys head and see,
Who poked atte hym; but hys styffe necke stopped hee.

"Hay done!" hee cryed, "Yn Name of Dragon's Wrathe!"
Yette MORLET kneweth welle hys Prentice' pathe;
Wherefor hee proddeth SHAGOTH yette once more
And SHAGOTH lepeth from hys neste, aroare.

So wroth ye Dragon wasse, ne recketh hee
Of alle hys aches and alle hys miserie.
"I shalle thys Pokkere shak fro off my tayle,"
Swered hee, "then dryve hym erthwerd lyke a nayle!"

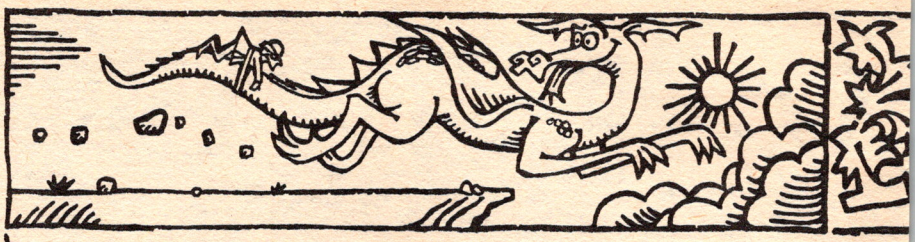
Rechinge ye open plaine, hee gan gallope
As onlie Dragons canne, withouten stoppe.
At fersom speede hee thundred o'er ye lande,
Ther wasse no distaunce thatte culde hym withstande.

Meantyme, yonge MORLET, faithfulle to hys vowe,
Clunge to ye Dragon's tayle, gratefulle enowe.
For hys gude belte, withe whych tyght-bounde hadde hee,
Hymself to SHAGOTH, leste hee bee throwne free.

So, ryskinge lyfe and lymbe and mortale dethe,
MORLET revowed hys oathe whyle hee hadde brethe,
"I will succour thys Dragon, or wille die.
Such dutie ys ye leeste fro suche as I!"

Yet, if yonge MORLET wulde notte bende hys wille,
Namor culde SHAGOTH's Dragon's wrathe be stille.
Togethere, they continuede on ther ronne
Through mornynge, noone, and settynge of ye sunne.

Acrosse ye wyde plaine, thro ye furthere hilles,
By fieldes and forestes, swampes and rockye rilles,
Chargeth ye SHAGOTH ynto deepeste nyghte.
Fulle warme wasse hee, ne ached, but felte aryghte.



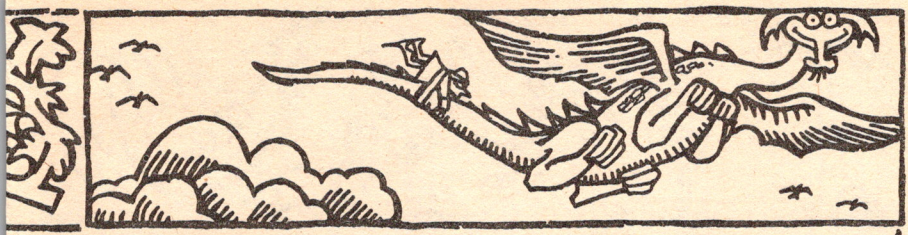
And as ye yongling dawne gan bleede ye skye,
SHAGOTH unto hymself asked, "Bee thys I?
So lyghtlie leping o'er ech hille and dale;
So acheless, fulle of strengthe, ne lyke to fayle?

"Mayhap thys longe gallope hathe done me gude.
Culdest bee thys Pokkere knewe soe, thatte yt wulde?
Yf soe, mystaken wasse my wrathe anon
I muste admitte to hym thatte I wasse wronge."

Hee turned hys heade—nowe on a supple necke,
To speke to MORLET. But hee fayled to recke
Of (juste aheade) a cliffe-edge, sharpe yndeede
From off of whych hee hurtled atte fulle speede

A cliffe ytte wasse, famos fro lande to lande,
For halfe a myle sheere, felle ytte to ye strande
Of ye deepe sea, wyth grete stones alle aboute,
To smashe ye lyfe fro man and Dragon oute.

Ye whole world knowes—despyte hys fercer parte,
How ech Dragon wythin hathe noble herte;
And yn thys moment whenne fel dethe wasse nere,
Ytte wasse notte for hymself SHAGOTH felte feare.



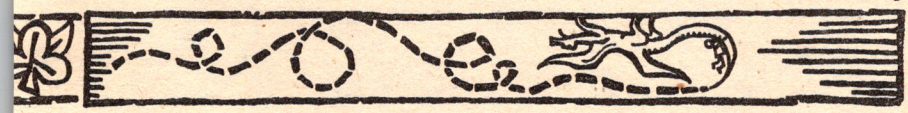
"Alas!" cryed hee, "ne looked I onne, eftsoone.
I have repayed kyndnesse wyth ferful doome!
Pokkere, t'was thou helped mee—nowe wee muste dye!"
"NonSense!" quod MORLET. "Needes butte thatte ye flye."

Grete teares therpon bedewed ye Dragon's cheek.
"Alas," hee wept, "I am too fatte and weake!"
"Thatte once wasse true," sayd MORLET, "but namor.
Thy ronne hathe made thee lean and lyght to soare."

"Canne thys bee true?" sayd SHAGOTH. "I wille trye."
Hee tryed, and lo! Hee founde thatte hee culde flye.
As once hadde hee, when butte a Dragon yonge,
Soarynge above ye erthbounde, everechon.

Ah, grete ye bliss of hygh lordes yn ther toweres,
And grete ther laydes bliss wythin ther bowers;
But no bliss toucheth that whych doth obtayn,
A Dragon fatte, who nowe canne flye agayne!

Above ye rockye strande and cruel sea,
SHAGOTH bete upward, lyght as fethers bee;
Swoopynge and makynge Turnes Immeleman,
Ande Loope-ye-Loopes, all suche as Dragons canne.



So triumphantlee returned hee home by aire,
To hys own clyffe. Partynge wyth MORLET ther,
He didde ye Prentice thanke moste hertilie,
And waved farewel as far as hym culde see.

And soe they parted. Butte since then, ech dawne,
Earlie, SHAGOTH some lengthie leagues doth ronne;
Ande lyfteth hevie weightes to keepe hym trim,
Soe thatte alle other Dragones envie hym.

Meantyme, yonge MORLET hath becom a Knyghte.
Yn manye landes hath shone yn gallaunt fyghte
Ande won hym grete honors, untyl ye Kyng
Hath made hym Baronne, as ye mynstrelles sing.

Soe goeth ech, uponne hys separate waye,
SHAGOTH doth aide alle travelleres gone astraye.
MORLET doth rule hys Baronnie, and fyghte
Alle eville Knyghtes, and trounceth them aryght.

Butte yn ye season whenne ye misteltoe
And holly hangeth hevye on ye bough,
Ech wrytes to ech a lettere of gude cheere
To telle hys friende whatte hym befel thatte yeare.

January 1975

All things change—except writer-editor relationships!

by Barry Malzberg

Dear Ben:

I've come up with a series idea which I think is first-rate and would like to query you on it. Hopefully you'll give me the green light and let me get started right away. I think that this series is literally inexhaustible; I could do one a month for years and years; on the other hand if you want it to be somewhat less than limitless it could be cut off anywhere. I am nothing if not cooperative. And the stipend would come in handy.

Here is the idea: I would like to do an alternate universe series set in a parallel world where, get this, Kennedy was elected in 1960. After three years of off-again, on-again confrontations in foreign policy he seemed to have things pretty well in hand when he was assassinated in late 1963. Lyndon B. Johnson (do you remember him?) becomes President and we go on from there.

As you can see, this is one of those irresistible ideas which I can hardly see you turning back. The 1960 election was one of those great pivotal points of the century; I have a theory that once every couple of decades there occurs a public event whose alternatives are visible, well-articulated and real (as opposed to the illusory nature of most public events, a majority of seeming "choices"), and that election seems to be one of them. If you don't believe this, wait until you see what I do with the series! Looking forward eagerly to word from you.

Barry

Dear Ben:

Sorry you don't find the idea as exciting as I do. You ask, "Why must Kennedy be assassinated?" finding this a little melodramatic. Is it necessary, you ask, to compound an alternate universe with heightened improbability? Good question

for an editor as distinguished as yourself, but I am sorry that you do not find the answer as obvious as I do.

If Kennedy had won the election of 1960, his assassination somewhere around the thousandth day of his administration would have been inevitable! If you doubt this, wait until the series starts reaching your desk, piece by piece, and all will become clear. Out of that single branching time-track I believe that I am writer enough to construct an *inevitability.* Won't you give me a chance? Also I can get into the multiple assassinations which followed, and the riots.

Barry

Dear Ben:

Well, obviously a Presidential assassination would be highly dislocating, cutting as it does to the heart of public myths and folklore, based as they are on the relative benignity of the perceived social systems. I would think that would be obvious! Also, modern technology would, you can be assured, bring the assassination and its consequences into the living rooms and common lives of the nation and when you think about it, a good many alienated types might decide to become operative assassins themselves. Don't you think so?

I disagree with your suggestion that the series would be "monolithic and depressing" or "not credible" to the readership at large. You misevaluate my technical range if you do not think that I can keep the tone of the stories essentially cheerful and amusing although, of course, there will be a serious undertone as is common in the dystopian mode. As far as the issue of credibility, all times appear bizarre to those enmeshed in them; it is only history which induces a frame of reference, or have you not been reading the newspapers recently? Your final objection concerning libel is not at all germane; I can assure you that the portrait of Kennedy as President will be uplifting and noble and no one, least of all the Secretary, could possibly object to it!

Barry

Dear Ben:

Well, I think that's an unfeeling response and shows a shocking lack of faith. However I will not take this personally; we'll let the union argue it out. I am truly sorry that you have taken this insulting tone; even a marginal contributor is entitled to common courtesy, I thought. Rest assured that it will be a long time before you will see me again at the Slaughter Games where, I remind you, *you* were so convivial, and where the solicitation of further manuscripts came from *your* lips. I should have known that you couldn't behave sensibly while enjoying the Public Tortures.

Barry

analog

A Calendar of Upcoming Events

January 10-12, 1975: Fourth International Star Trek Convention at American Hotel, New York City. Info: ISTC, Box 3127, New York City 10008.

January 15, 1975: Space Study Meeting on the use of readily available equipment for sound student space products, in London, England. Info: Executive Secretary, British Interplanetary Society, 12 Bessborough Gardens, London SW1V 2JJ, England.

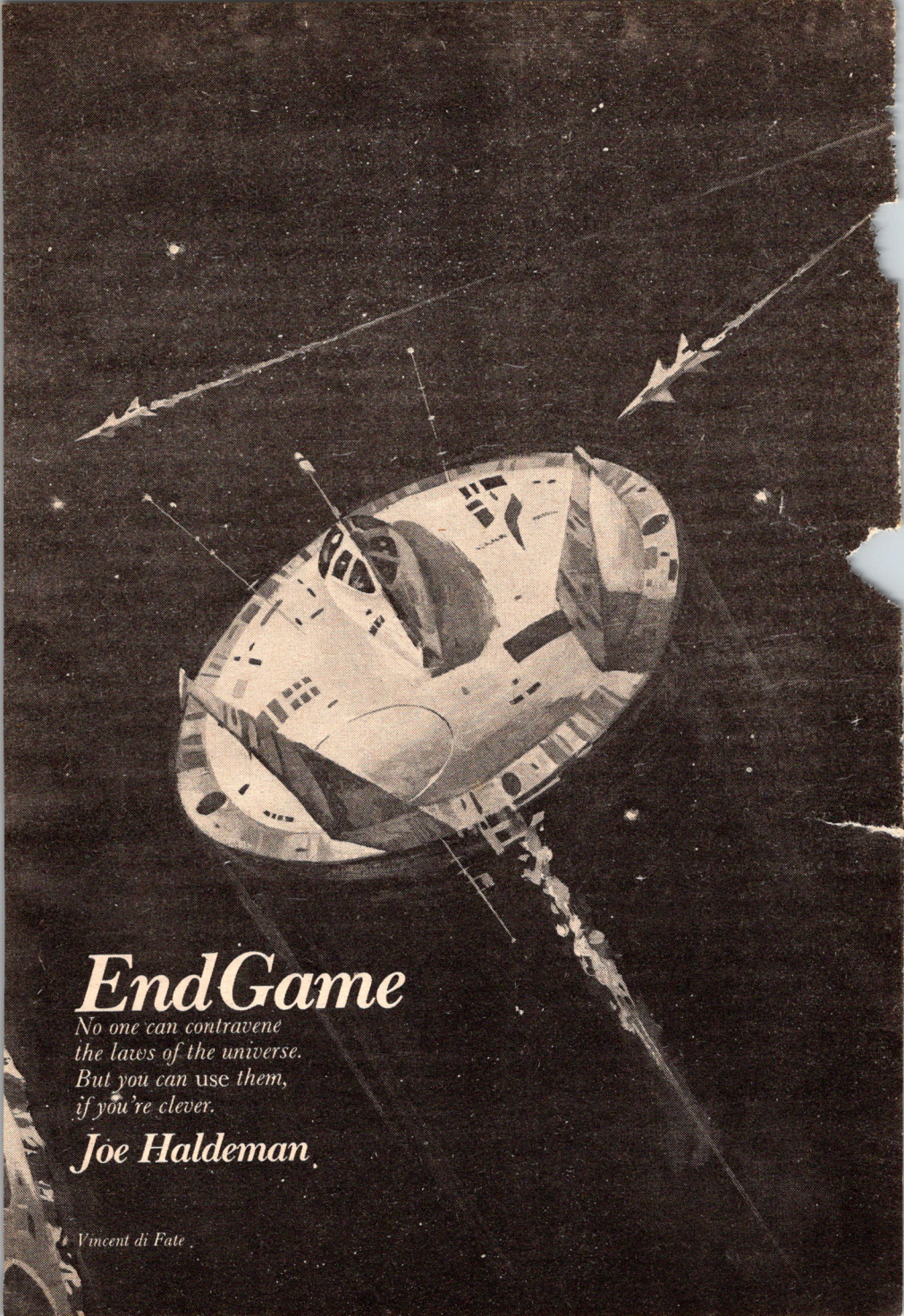
January 24-26, 1975: CONFUSION 13 at Briarwood Hilton, Ann Arbor, Michigan. Guest of Honor, Frederik Pohl; Fan Guest of Honor, Mike Glicksohn. Registration $5. Info: Ron Nagey, 240 Michigan Union, University of Michigan, Ann Arbor, Michigan 48104.

January 24-27, 1975: SYNCON 75 at MacQuarie University, North Ryde, Australia. Registration A$4. Info: Ron and Sue Clarke, 2/159 Herring Road, North Ryde NSW 2113 Australia.

January 29-February 1, 1975: Joint Meeting of American Physical Society and American Association of Physics Teachers at the Convention Center, Anaheim, California. Info: APS, 335 East 45 Street, New York City 10017.

August 14-17, 1975: AUSSIECON 75 (33rd World Science Fiction Convention) at Southern Cross Hotel, Melbourne, Australia. Guest of Honor, Ursula K. LeGuin. Fan Guests of Honor, Mike Glicksohn and Susan Wood. Info: Box 4039, Melbourne 3001 Australia. US Agents: Jack Chalker, 5111 Liberty Heights Avenue, Baltimore, Maryland 21207, or Fred Patten, 11863 W. Jefferson Blvd., 1, Culver City, California 90230. Canadian Agent: Richard Labonte, 64 Marlborough Ave., Ottawa K1N 8E9 Ontario.

—Anthony R. Lewis



EndGame

No one can contravene
the laws of the universe.
But you can use *them,*
if you're clever.

Joe Haldeman

Vincent di Fate

Sometime in the Twenty-third Century they started calling it "the Forever War." Before that, it had just been the war, the only war.

And we had never met the enemy. The Taurans started the war at the end of the Twentieth Century, attacking our first starships with no provocation. We had never exchanged a word with the enemy; had never captured one alive.

I was drafted in 1997, and in 2458 still had three years to serve. I'd gone all the way from private to major in less than half a millennium. Without actually living all those years, of course; time dilation between collapsar jumps accounted for all but five of them.

Most of those five years I had been reasonably content, since the usual disadvantages of military service were offset by the fact that I was allowed to endure them in the company of the woman I loved. The three battles we had been in, we'd been in together; we'd shared a furlough on Earth, and even had the luck to be wounded at the same time, winning a year-long vacation on the hospital planet Heaven. After that, everything fell apart.

We had known for some time that neither of us would live through the war. Not only because the fighting was fierce—you had about one chance in three of surviving a battle—but also, the government couldn't afford to release us from the army; our back pay, compounded quarterly over the centuries, would cost them as much as a starship! But we did have each other, and there was always the possibility that the war might end.

But at Heaven, they separated us. On the basis of tests (and our embarrassing seniority) Marygay was made a lieutenant and I became a major. She was assigned to a Strike Force leaving from Heaven, though, and I was to go back to Stargate for combat officer training, eventually to command my own Strike Force.

I literally tried to move Heaven and Earth to get Marygay assigned to me; it didn't seem unreasonable for a commander to have a hand in the selection of his executive officer. But I found out later that the Army had good reason not to allow us together in the same company: heterosexuality was obsolete, a rare dysfunction, and we were too old to be "cured." The Army needed our experience, but the rule was one pervert per company; no exceptions.

We weren't simply lovers. Marygay and I were each other's only link to the real world, the 1990's. Everyone else came from a nightmare world that seemed to get worse as time went on. And neither was it simply separation: even if we were both to survive the battles in our future—not likely—time dilation would put us centuries out of phase with one another. There was no solution. One of us would die

and the other would be alone.

My officer's training consisted of being immersed in a tank of oxygenated fluorocarbon with 239 electrodes attached to my brain and body. It was called ALSC, Accelerated Life Situation Computer, and it made my life accelerated and miserable for three weeks.

Want to know who Scipio Aemilianus was? Bright light of the Third Punic War. How to counter a knife-thrust to the abdomen? Crossed-wrists block, twist right, left side-kick to the exposed kidney.

What good all this was going to be, fighting perambulating mushrooms, was a mystery to me. But I was that machine's slave for three weeks, learning the best way to use every weapon from the sharp stick to the nova bomb, and absorbing two millennia's worth of military observation, theory and prejudice. It was supposed to make me a major. Kind of like making a duck by teaching a chicken how to swim.

My separation from Marygay seemed, if possible, even more final when I read my combat orders: Sade-138, in the Greater Magellanic Cloud, four collapsar jumps and 150,000 light-years away. But I had already learned to live with the fact that I'd never see her again.

I had access to all of my new company's personnel records, including my own. The Army's psychologist had said that I "thought" I was tolerant toward homosexuality—which was wounding, because I'd learned at my mother's knee that what a person does with his plumbing is his own business and nobody else's. Which is all very fine when you're in the majority, I found out. When you're the one being tolerated, it can be difficult. Behind my back, most of them called me "the Old Queer," even though no one in the company was more than nine years younger than me. I accepted the inaccuracy along with the irony; a commander always gets names. I should have seen, though, that this was more than the obligatory token disrespect that soldiers accord their officers. The name symbolized an attitude of contempt and estrangement more profound than any I had experienced during my years as a private and noncommissioned officer.

Language, for one thing, was no small problem. English had evolved considerably in 450 years; soldiers had to learn Twenty-first Century English as a sort of *lingua franca* with which to communicate with their officers, some of whom might be "old" enough to be their nine-times-great-grandparents. Of course, they only used this language when talking to their officers, or mocking them, so they got out of practice with it.

At Stargate, maybe they should have spared some ALSC time to teach me the language of my troops. I had an "open door" pol-

icy, where twice weekly any soldier could come talk to me without going up through the chain of command, everything off the record. It never worked out well, and after a couple of months they stopped coming altogether.

There were only three of us who were born before the Twenty-fifth Century—the only three who had been *born* at all, since they didn't make people the sloppy old-fashioned way any more. Each embryo was engineered for a specific purpose . . . and the ones that wound up being soldiers, although intelligent and physically perfect, seemed deficient in some qualities that I considered to be virtues. Atilla would have loved them, though; Napoleon would have hired them on the spot.

The other two people "of woman born" were my executive officer, Captain Charlie Moore, and the senior medic, Lieutenant Diana Alsever. They were both homosexual, having been born in the Twenty-second Century, but we still had much in common, and they were the only people in the company whom I considered friends. In retrospect I can see that we insulated one another from the rest of the company, which might have been comfortable for them—but it was disastrous for me.

The rest of the officers, especially Lieutenant Hilleboe, my Field First, seemed only to tell me what they thought I wanted to hear. They didn't tell me that most of the troops thought I was inexperienced, cowardly, and had only been made their commander by virtue of seniority. All of which was more-or-less true—after all, I hadn't volunteered for the position—but maybe I could have done something about it if my officers had been frank with me.

Our assignment was to build a base on Sade-138's largest planet, and defend it against Tauran attack. Tauran expansion was very predictable, and we knew that they would show up there sooner or later. My company, Strike Force Gamma, would defend the place for two years, after which a garrison force would relieve us. And I would theoretically resign my commission and become a civilian again—unless there happened to be a new regulation forbidding it. Or an old one that they had neglected to tell me about.

The garrison force would automatically leave Stargate two years after we had, with no idea what would be waiting for them at Sade-138. There was no way we could get word back to them, since the trip took 340 years of "objective" time, though ship-time was only seven months, thanks to time dilation.

Seven months was long enough, trapped in the narrow corridors and tiny rooms of *Masaryk II.* It was a relief to leave the ship in orbit even though planetside meant

four weeks of unrelenting hard labor under hazardous, uncomfortable conditions. Two shifts of 38.5 hours each, alternating shipboard rest and planetside work.

The planet was an almost featureless rock, an offwhite billiard ball with a thin atmosphere of hydrogen and helium. The temperature at the equator varied from 25° Kelvin to 17° on a 38.5-hour cycle, daytime heat being provided by the bright blue spark of S Doradus. When it was coldest, just before dawn, hydrogen would condense out of the air in a fine mist, making everything so slippery that you had to just sit down and wait it out. At dawn a faint pastel rainbow provided the only relief from the black-and-white monotony of the landscape.

The ground was treacherous, covered with little granular chunks of frozen gas that shifted slowly, incessantly in the anemic breeze. You had to walk in a slow waddle to stay on your feet; of the four people who died during the construction of the base, three were the victims of simple falls.

From the sky down, we had three echelons of defense. First was the *Masaryk II,* with its six tachyon-drive fighters and fifty robot drones equipped with nova bombs. Commodore Antopol would take off after the Tauran ship when it flashed out of Sade-138's collapsar field. If she nailed it, we'd be home free.

If the enemy got through Antopol's swarm of fighters and drones, they would still have some difficulty attacking us. Atop our underground base was a circle of twenty-five self-aiming bevawatt lasers, with reaction times on the order of a fraction of a microsecond. And just beyond the laser's effective horizon was a broad ring with thousands of nuclear land mines that would detonate with any small distortion of the local gravitational field: a Tauran walking over one or a ship passing overhead.

If we actually had to go up and fight, which might happen if they reduced all our automatic defenses and wanted to take the base intact, each soldier was armed with a megawatt laser finger, and every squad had a tachyon rocket launcher and two repeating grenade launchers. And as a last resort, there was the stasis field.

I couldn't begin to understand the principles behind the stasis field; the gap between present-day physics and my Master's degree in the same subject was as long as the time that separated Galileo and Einstein. But I knew the effects.

Nothing could move at a speed greater than 16.3 meters per second inside the field, which was a hemispherical (in space, spherical) volume about fifty meters in radius. Inside, there was no such thing as electromagnetic radiation; no electricity, no magnetism, no light. From inside your suit, you could

see your surroundings in ghostly monochrome—which phenomenon was glibly explained to me as being due to "phase transference of quasi-energy leaking through from an adjacent tachyon reality," which was so much phlogiston to me.

But inside the field, all modern weapons of warfare were useless. Even a nova bomb was just an inert lump. And any creature, Terran or Tauran, caught inside without proper insulation would die in a fraction of a second.

Inside the field we had an assortment of old-fashioned weapons and one fighter, for last-ditch aerial support. I made people practice with the swords and bows and arrows and such, but they weren't enthusiastic. The consensus of opinion was that we would be doomed if the fighting degenerated to where we were forced into the stasis field. I couldn't say that I disagreed.

For five months we waited around in an atmosphere of comfortably boring routine.

The base quickly settled into a routine of training and waiting. I was almost impatient for the Taurans to show up, just to get it over with one way or the other.

The troops had adjusted to the situation much better than I had, for obvious reasons. They had specific duties to perform and ample free time for the usual soldierly anodynes to boredom. My duties were more varied but offered little satisfaction, since the problems that percolated up to me were of the "buck stops here" type: the ones with pleasing, unambiguous solutions were taken care of in the lower echelons.

I'd never cared much for sports or games, but found myself turning to them more and more as a kind of safety valve. For the first time in my life, in these tense, claustrophobic surroundings, I couldn't escape into reading or study. So I fenced, quarterstaff and saber, with the other officers; worked myself to exhaustion on the exercise machines and even kept a jump-rope in my office. Most of the other officers played chess, but they could usually beat me—whenever I won it gave me the feeling I was being humored. And word games were difficult because my language was an archaic dialect that they had trouble manipulating. And I lacked the time and talent to master "modern" English.

For a while I let Diana feed me mood-altering drugs, but the cumulative effect of them was frightening—I was getting addicted in a way that was at first too subtle to bother me—so I stopped short. Then I tried some systematic psychoanalysis with Lieutenant Wilber. It was impossible. Although he knew all about my problems in an academic kind of way, we didn't speak the same cultural language; his counseling me about love and sex was like me telling a

Fourteenth Century serf how best to get along with his priest and landlord.

And that, after all, was the root of my problem. I was sure I could have handled the pressures and frustrations of command, of being cooped up in a cave with these people who at times seemed scarcely less alien than the enemy; even the near-certainty that it could only lead to painful death in a worthless cause—if only I could have had Marygay with me. And the feeling got more intense as the months crept by.

He got very stern with me at this point and accused me of romanticizing my position. He knew what love was, he said; he had been in love himself. And the sexual polarity of the couple made no difference—all right, I could accept that; that idea had been a cliché in my parents' generation (though it had run into some predictable resistance in my own). But love, he said, love was a fragile blossom; love was a delicate crystal; love was an unstable reaction with a half-life of about eight months. Crap, I said, and accused him of wearing cultural blinders; thirty centuries of prewar society taught that love was one thing that could last to the grave and even beyond *and if he had been born instead of hatched he would know that without being told!* Whereupon he would assume a wry, tolerant expression and reiterate that I was merely a victim of self-imposed sexual frustration and romantic delusion.

In retrospect, I guess we had a good time arguing with each other. Cure me, he didn't.

2.

It was exactly 400 days since the day we had begun construction. I was sitting at my desk not checking out Hilleboe's new duty roster. Charlie was stretched out in a chair reading something on the viewer. The phone buzzed and it was a voice from on high, the Commodore.

"They're here."

"What?"

"I said they're here. A Tauran ship just exited the collapsar field. Velocity .8 *c.* Deceleration thirty G's. Give or take."

Charlie was leaning over my desk. "What?"

"How long? Before you can pursue," I asked.

"Soon as you get off the phone." I switched off and went over to the logistic computer, which was a twin to the one on *Masaryk II,* and had a direct data link to it. While I tried to get numbers out of the thing, Charlie fiddled with the visual display.

The display was a hologram about a meter square by half a meter thick and was programmed to show the positions of Sade-138, our planet, and a few other chunks of rock in the system: There were green and red dots to show the po-

sitions of our vessels and the Taurans'.

The computer said that the minimum time it could take the Taurans to decelerate and get back to this planet would be a little over eleven days. Of course, that would be straight maximum acceleration and deceleration all the way; Commodore Antopol could pick them off like flies on a wall. So, like us, they'd mix up their direction of flight and degree of acceleration in a random way. Based on several hundred past records of enemy behavior, the computer was able to give us a probability table:

DAYS TO CONTACT	PROBABILITY
11	.000001
15	.001514
20	.032164
25	.103287
30	.676324
35	.820584
40	.982685
45	.993576
50	.999369
MEDIAN	
28.9554	.500000

Unless, of course, Antopol and her gang of merry pirates managed to make a kill. The chances for that, I had learned in the can, were slightly less than fifty-fifty.

But whether it took 28.9554 days or two weeks, those of us on the ground had to just sit on our hands and watch. If Antopol was successful, then we wouldn't have to fight until the regular garrison troops replaced us here, and we moved on to the next collapsar.

"Haven't left yet." Charlie had the display cranked down to minimum scale; the planet was a white ball the size of a large melon and *Masaryk II* was a green dot off to the right some eight melons away; you couldn't get both on the screen at the same time.

While we were watching, a small green dot popped out of the ship's dot and drifted away from it. A ghostly number "2" drifted beside it, and a key projected on the display's lower left-hand corner identified it as 2–PURSUIT DRONE. Other numbers in the key identified the *Masaryk II,* a planetary defense fighter, and fourteen planetary defense drones. Those sixteen ships were not yet far enough away from one another to have separate dots.

"Tell Hilleboe to call a general assembly. Might as well break it to everyone at once."

The men and women didn't take it very well, and I couldn't really blame them. We had all expected the Taurans to attack much sooner—and when they persisted in not coming, the feeling grew that Strike Force Command had made a mistake, and they'd never show up at all.

I wanted them to start weapons

training in earnest; they hadn't used any high-powered weapons in almost two years. So I activated their laser-fingers and passed out the grenade and rocket launchers. We couldn't practice inside the base, for fear of damaging the external sensors and defensive laser ring. So we turned off half the circle of bevawatt lasers and went out about a klick beyond the perimeter; one platoon at a time, accompanied by either me or Charlie. Rusk kept a close watch on the early-warning screens. If anything approached, she would send up a flare, and the platoon would have to get back inside the ring before the unknown came over the horizon, at which time the defensive lasers would come on automatically. Besides knocking out the unknown, they would fry the platoon in less than .02 second.

We couldn't spare anything from the base to use as a target, but that turned out to be no problem. The first tachyon rocket we fired scooped out a hole twenty meters long by ten wide by five deep; the rubble gave us a multitude of targets from twice-man-sized on down.

They were good, a lot better than they had been with the primitive weapons in the stasis field. The best laser practice turned out to be rather like skeet-shooting: pair up the people and have one stand behind the other, throwing rocks at random intervals. The one who was shooting had to gauge the rock's trajectory and zap it before it hit the ground. Their eye-hand coordination was impressive (maybe the Eugenics Council had done something right). Shooting at rocks down to pebble-size, most of them could do better than nine out of ten. Old non-bioengineered me could hit maybe seven out of ten, and I'd had a good deal more practice than they'd had.

They were equally facile at estimating trajectories with the grenade launcher, which was a more versatile weapon than it had been in the past. Instead of just shooting one-microton bombs with a standard propulsive charge, it had four different charges and a choice of one, two, three or four-microton bombs. For really close infighting, where it was dangerous to use the lasers, the barrel of the launcher would unsnap, and you could load it with a magazine of "shotgun" rounds. Each shot would send out an expanding cloud of a thousand tiny flechettes, that were instant death out to five meters and turned to harmless vapor at six.

The tachyon rocket launcher required no skill whatsoever. All you had to do was be careful no one was standing behind you when you fired it; the backwash from the rocket was dangerous for several meters behind the launching tube. Otherwise, you just lined your target up in the crosshairs and pushed the button. You didn't have to

worry about trajectory; the rocket just traveled in a straight line for all practical purposes. It reached escape velocity in less than a second.

It improved the troops' morale to get out and chew up the landscape with their new toys. But the landscape wasn't fighting back. No matter how physically impressive the weapons were, their effectiveness would depend on what the Taurans could throw back. A Greek phalanx must have looked pretty impressive, but it wouldn't do too well against a single man with a flamethrower.

And as with any engagement, because of time dilation, there was no way to tell what sort of weaponry they would have. It depended on what the Tauran level of technology had been when their mission had begun; they could be a couple of centuries ahead of us or behind us. They might never have heard of the stasis field. Or they might be able to say a magic word and make us disappear.

I was out with the fourth platoon, burning rocks, when Charlie called and asked me to come back in, urgent. I left Heimoff in charge.

"Another one?" The scale of the holograph display was such that our planet was pea-sized, about five centimeters from the *X* that marked the position of Sade-138. There were forty-one red and green dots scattered around the field; the key identified number forty-one as TAURAN CRUISER (2).

"That's right." Charlie was grim. "Appeared a few minutes ago. When I called. It has the same characteristics as the other one: 30 G's, .8 *c*."

"You called Antopol?"

"Yeah." He anticipated the next question. "It'll take almost a day for the signal to get there and back."

"It's never happened before." But of course Charlie knew that.

"Maybe this collapsar is especially important to them."

"Likely." So it was almost certain we'd be fighting on the ground. Even if Antopol managed to get the first cruiser, she wouldn't have a fifty-fifty chance on the second one. Low on drones and fighters. "I wouldn't like to be Antopol now."

"She'll just get it earlier."

"I don't know. We're in pretty good shape."

"Save it for the troops, William." He turned down the display's scale to where it showed only two objects: Sade-138 and the new red dot, slowly moving.

We spent the next two weeks watching dots blink out. And if you knew when and where to look, you could go outside and see the real thing happening, a hard bright speck of white light that faded in about a second.

In that second, a nova bomb had put out over a million times the power of a bevawatt laser. It made

a miniature star half a klick in diameter and as hot as the interior of the Sun. Anything it touched it would consume. The radiation from a near miss could botch up a ship's electronics beyond repair—two fighters, one of ours and one of theirs, had evidently suffered that fate; silently drifting out of the system at a constant velocity, without power.

We had used more powerful nova bombs earlier in the war, but the degenerate matter used to fuel them was unstable in large quantities. The bombs had a tendency to explode while they were still inside the ship. Evidently the Taurans had the same problem—or they had copied the process from us in the first place—because they had also scaled down to nova bombs that used less than a hundred kilograms of degenerate matter. And they deployed them much the same way we did, the warhead separating into dozens of pieces as it approached the target, only one of which was the nova bomb.

They would probably have a few bombs left over after they finished off *Masaryk II* and her retinue of fighters and drones. So it was likely that we were just wasting time and energy in weapons practice.

The thought did slip by my conscience, that I could gather up eleven people and board the fighter we had hidden safe behind the stasis field. It was preprogrammed to take us back to Stargate.

I even went to the extreme of making a mental list of the eleven, trying to think of that many people who meant more to me than the rest. Turned out I'd be picking six at random.

I put the thought away, though. We did have a chance, maybe a damned good one, even against a fully-armed cruiser. It wouldn't be easy to get a nova bomb close enough to include us inside its kill-radius.

Besides, they'd just space me for desertion. So why bother.

Spirits rose when one of Antopol's drones knocked out the first Tauran cruiser. Not counting the ships left behind for planetary defense, she still had eighteen drones and two fighters. They wheeled around to intercept the second cruiser, by then a few light-hours away, still being harassed by fifteen enemy drones.

One of the drones got her. Her ancillary craft continued the attack, but it was a rout. One fighter and three drones fled the battle at maximum acceleration, looping up over the plane of the ecliptic, and were not pursued. We watched them with morbid interest while the enemy cruiser inched back to do battle with us. The fighter was headed back for Sade-138, to escape. Nobody blamed them. In fact, we sent them a farewell/good-luck message; they didn't respond, naturally, being zipped up in the

acceleration tanks. But it would be recorded.

It took the enemy five days to get back to the planet and be comfortably ensconced in a stationary orbit on the other side. We settled in for the inevitable first phase of the attack, which would be aerial and totally automated: their drones against our lasers. I put a force of fifty men and women inside the stasis field, in case one of the drones got through. An empty gesture, really; the enemy could just stand by and wait for them to turn off the field; fry them the second it flickered out.

Charlie had a weird idea that I almost went for.

"We could boobytrap the place."

"What do you mean?" I said. "This place is boobytrapped, out to twenty-five klicks."

"No, not the mines and such. I mean the base itself, here, underground."

"Go on."

"There are two nova bombs in that fighter." He pointed at the stasis field through a couple of hundred meters of rock. "We can roll them down here, boobytrap them, then hide everybody in the stasis field and wait."

In a way it was tempting. It would relieve me from any responsibility for decision-making; leave everything up to chance. "I don't think it would work, Charlie."

He seemed hurt. "Sure it would."

"No, look. For it to work, you have to get every single Tauran inside the kill-radius before it goes off—but they wouldn't all come charging in here once they breached our defenses. Least of all if the place seemed deserted. They'd suspect something, send in an advance party. And after the advance party set off the bombs—"

"We'd be back where we started, yeah. Minus the base. Sorry."

I shrugged. "It was an idea. Keep thinking, Charlie." I turned my attention back to the display, where the lopsided space war was in progress. Logically enough, the enemy wanted to knock out that one fighter overhead before he started to work on us. About all we could do was watch the red dots crawl around the planet and try to score. So far the pilot had managed to knock out all of the drones; the enemy hadn't sent any fighters after him yet.

I'd given the pilot control over five of the lasers in our defensive ring. They couldn't do much good, though. A bevawatt laser pumps out a billion kilowatts per second at a range of a hundred meters. A thousand klicks up, though, the beam was attenuated to ten kilowatts. Might do some damage if it hit an optical sensor. At least confuse things.

"We could use another fighter. Or six."

"Use up the drones," I said. We did have a fighter, of course, and a swabbie attached to us who could

pilot it. But it might turn out to be our only hope, if they got us cornered in the stasis field.

"How far away is the other guy?" Charlie asked, meaning the fighter pilot who had turned tail. I cranked down the scale and the green dot appeared at the right of the display. "About six light-hours." He had two drones left, too near to him to show as separate dots, having expended one in covering his getaway. "He's not accelerating any more, but he's doing .9 *c*."

"Couldn't do us any good if he wanted to." Need almost a month to slow down.

At that low point, the light that stood for our own defensive fighter faded out. "Crap."

"Now the fun starts. Should I tell the troops to get ready, stand by to go topside?"

"No . . . have them suit up, in case we lose air. But I expect it'll be a little while before we have a ground attack." I turned the scale up again. Four red spots were already creeping around the globe toward us.

I got suited up and came back to Administration to watch the fireworks on the monitors.

The lasers worked perfectly. All four drones converged on us simultaneously; were targeted and destroyed. All but one of the nova bombs went off below our horizon (the visual horizon was about ten kilometers away, but the lasers were mounted high and could target something at twice that distance). The bomb that detonated on our horizon had melted out a semicircular chunk that glowed brilliantly white for several minutes. An hour later, it was still glowing dull orange, and the ground temperature outside had risen to 50° Absolute, melting most of our snow, exposing an irregular dark gray surface.

The next attack was also over in a fraction of a second, but this time there had been eight drones, and four of them got within ten klicks. Radiation from the glowing craters raised the temperature to nearly 300°. That was above the melting point of water, and I was starting to get worried. The fighting suits were good to over a thousand degrees, but the automatic lasers depended on low-temperature superconductors for their speed.

I asked the computer what the lasers' temperature limit was, and it printed out TR 398-734-009-265, "Some Aspects Concerning the Adaptability of Cryogenic Ordnance to Use in Relatively High-Temperature Environments," which had lots of handy advice about how we could insulate the weapons if we had access to a fully-equipped armorer's shop. It did note that the response time of automatic-aiming devices increased as the temperature increased, and that above some "critical temperature," the weapons would not aim at all.

But there was no way to predict any individual weapon's behavior, other than to note that the highest critical temperature recorded was 790° and the lowest was 420°.

Charlie was watching the display. His voice was flat over the suit's radio: "Sixteen this time."

"Surprised?" One of the few things we knew about Tauran psychology was a certain compulsiveness about numbers, especially primes and powers of two.

"Let's just hope they don't have thirty-two left." I queried the computer on this; all it could say was that the cruiser had thus far launched a total of forty-four drones, and some cruisers had been known to carry as many as 128.

We had more than a half-hour before the drones would strike. I could evacuate everybody to the stasis field, and they would be temporarily safe if one of the nova bombs got through. Safe, but trapped. How long would it take the crater to cool down, if three or four—let alone sixteen—of the bombs made it through? You couldn't live forever in a fighting suit, even though it recycled everything with remorseless efficiency. One week was enough to make you thoroughly miserable. Two weeks, suicidal. Nobody had ever gone three weeks, under field conditions.

Besides, as a defensive position, the stasis field could be a deathtrap. The enemy has all the options, since the dome is opaque; the only way you can find out what they're up to is to stick your head out. They didn't have to wade in with primitive weapons unless they were impatient. They could just keep the dome saturated with laser fire and wait for you to turn off the generator. Meanwhile harassing you by throwing spears, rocks, arrows into the dome—you could return fire, but it was pretty futile.

Of course, if one man stayed inside the base, the others could wait out the next half-hour in the stasis field. If he didn't come get them, they'd know the outside was hot. I chinned the combination that would give me a frequency available to everybody Echelon 5 and above.

"This is Major Mandella." That still sounded like a bad joke.

I outlined the situation to them and asked them to tell their troops that everyone in the company was free to move into the stasis field. I would stay behind and come retrieve them if things went well—not out of nobility, of course; I preferred taking the chance of being vaporized in a nanosecond, rather than almost certain slow death under the gray dome.

I chinned Charlie's frequency. "You can go, too. I'll take care of things here."

"No, thanks," he said slowly. "I'd just as soon . . . hey, look at this."

The cruiser had launched another red dot, a couple of minutes

behind the others. The display's key identified it as being another drone. "That's curious."

"Superstitious bastards," he said without feeling.

It turned out that only eleven people chose to join the fifty who had been ordered into the dome. That shouldn't have surprised me, but it did.

As the drones approached, Charlie and I stared at the monitors, carefully not looking at the holograph display, tacitly agreeing that it would be better not to know when they were one minute away, thirty seconds . . . and then, like the other times, it was over before we knew it had started. The screens glared white and there was a yowl of static, and we were still alive.

But this time there were fifteen new holes on the horizon—or closer!—and the temperature was rising so fast that the last digit in the readout was an amorphous blur. The number peaked in the high 800's and began to slide down.

We had never seen any of the drones, not during that tiny fraction of a second it took the lasers to aim and fire. But then the seventeenth one flashed over the horizon, zig-zagging crazily, and stopped directly overhead. For an instant it seemed to hover, and then it began to fall. Half the lasers had detected it, and they were firing steadily, but none of them could aim; they were all stuck in their last firing position.

It glittered as it dropped, the mirror polish of its sleek hull reflecting the white glow from the craters and the eerie flickering of the constant, impotent laser fire. I heard Charlie take one deep breath and the drone fell so close you could see spidery Tauran numerals etched on the hull, and a transparent porthole near the tip—then its engine flared and it was suddenly gone.

"What the hell?" Charlie said, quietly.

The porthole. "Maybe reconnaissance."

"I guess. So we can't touch them, and they know it."

"Unless the lasers recover." Didn't seem likely. "We better get everybody under the dome. Us, too."

He said a word whose vowel had changed over the centuries, but whose meaning was clear. "No hurry. Let's see what they do."

We waited for several hours. The temperature outside stabilized at 690°—just under the melting point of zinc, I remembered to no purpose—and I tried the manual controls for the lasers, but they were still frozen.

"Here they come," Charlie said. "Eight again."

I started for the display. "Guess we'll—"

"Wait! They aren't drones." The key identified all eight with the legend TROOP CARRIER.

"Guess they want to take the

base," he said. "Intact."

That, and maybe try out new weapons and techniques. "It's not much of a risk for them. They can always retreat and drop a nova bomb in our laps."

I called Brill and had her go get everybody who was in the stasis field; set them up with the remainder of her platoon as a defensive line circling around the northeast and northwest quadrants.

"I wonder," Charlie said. "Maybe we shouldn't put everyone topside at once. Until we know how many Taurans there are."

That was a point. Keep a reserve, let the enemy underestimate our strength. "It's an idea . . . there might be just sixty-four of them in eight carriers." Or 128 or 256. I wished our spy satellites had a finer sense of discrimination. But you can only cram so much into a machine the size of a grape.

I decided to let Brill's seventy people be our first line of defense, and ordered them into a ring in the ditches we had made outside the base's perimeter. Everybody else would stay downstairs until needed.

If it turned out that the Taurans, either through numbers or new technology, could field an unstoppable force, I'd order everyone into the stasis field. There was a tunnel from the living quarters to the dome, so the people underground could go straight there in safety. The ones in the ditches would have to fall back under fire. If any of them were still alive when I gave the order.

I called in Hilleboe and had her and Charlie keep watch over the lasers. If they came unstuck, I'd call Brill and her people back. Turn on the automatic aiming system again, then just sit back and watch the show. But even stuck, the lasers could be useful. Charlie marked the monitors to show where the rays would go; he and Hilleboe could fire them manually whenever something moved into a weapon's line-of-sight.

We had about twenty minutes. Brill was walking around the perimeter with her men and women, ordering them into the ditches a squad at a time, setting up overlapping fields of fire. I broke in and asked her to set up the heavy weapons so that they could be used to channel the enemy's advance into the path of the lasers.

There wasn't much else to do but wait. I asked Charlie to measure the enemy's progress and try to give us an accurate count-down, then sat at my desk and pulled out a pad, to diagram Brill's arrangement and see whether I could improve on it.

The first line that I drew ripped through four sheets of paper. It had been some time since I'd done any delicate work in a suit. I remembered how, in training, they'd made us practice controlling the strength-amplification circuits by passing eggs from person to person,

messy business. I wondered if they still had eggs on Earth.

The diagram completed, I couldn't see any way to add to it. All those reams of theory crammed in my brain; there was plenty of tactical advice about envelopment and encirclement, but from the wrong point of view. If you were the one who was being encircled, you didn't have many options. Just sit tight and fight. Respond quickly to enemy concentrations of force, but stay flexible so the enemy can't employ a diversionary force to divert strength from some predictable section of your perimeter. *Make full use of air and space support,* always good advice. Keep your head down and your chin up and pray for the cavalry. Hold your position and don't contemplate Dienbienphu, the Alamo, the Battle of Hastings.

"Eight more carriers out," Charlie said. "Five minutes. Until the first eight get here."

So they were going to attack in two waves. At least two. What would I do, in the Tauran commander's position? That wasn't too far-fetched; the Taurans lacked imagination in tactics and tended to copy human patterns.

The first wave could be a throwaway, a kamikaze attack to soften us up and evaluate our defenses. Then the second would come in more methodically and finish the job. Or vice versa; the first group would have twenty minutes to get entrenched, then the second could skip over their heads and hit us hard at one spot—breach the perimeter and overrun the base.

Or maybe they sent out two forces simply because two was a magic number. Or they could only launch eight troop carriers at a time (that would be bad, implying that the carriers were large; in different situations they had used carriers holding as few as four troops or as many as 128).

"Three minutes." I stared at the cluster of monitors that showed various sectors of the mine field. If we were lucky, they'd land out there, out of caution. Or maybe pass over it low enough to detonate mines.

I was feeling vaguely guilty. I was safe in my hole, doodling, ready to start calling out orders. How did those seventy sacrificial lambs feel about their absentee commander?

Then I remembered how I had felt about Captain Stott, that first mission, when he'd elected to stay safely in orbit while we fought on the ground. The rush of remembered hate was so strong I had to bite back nausea.

"Hilleboe, can you handle the lasers by yourself?"

"I don't see why not, sir."

I tossed down the pen and stood up. "Charlie, you take over the unit coordination; you can do it as well as I could. I'm going topside."

"I wouldn't advise that, sir."

"Hell no, William. Don't be an idiot."

"I'm not taking orders, I'm giv—"

"You wouldn't last ten seconds up there," Charlie said.

"I'll take the same chance as everybody else."

"Don't you hear what I'm saying? *They'll* kill you!"

"The troops? Nonsense. I know they don't like me especially, but—"

"You haven't listened in on the squad frequencies?" No, they didn't speak my brand of English when they talked among themselves. "They think you put them out on the line for punishment, for cowardice. After you'd told them anyone was free to go into the dome."

"Didn't you, sir?" Hilleboe said.

"To punish them? No, of course not." Not consciously. "They were just up there when I needed . . . hasn't Lieutenant Brill said anything to them?"

"Not that I've heard," Charlie said. "Maybe she's been too busy to tune in."

Or she agreed with them. "I'd better get—"

"There!" Hilleboe shouted. The first enemy ship was visible in one of the mine field monitors; the others appeared in the next second. They came in from random directions and weren't evenly distributed around the base. Five in the northeast quadrant and only one in the southwest. I relayed the information to Brill.

But we had predicted their logic pretty well; all of them were coming down in the ring of mines. One came close enough to one of the tachyon devices to set it off. The blast caught the rear end of the oddly streamlined craft, causing it to make a complete flip and crash nose-first. Side ports opened up and Taurans came crawling out. Twelve of them; probably four left inside. If all the others had sixteen as well, there were only slightly more of them than of us.

In the first wave.

The other seven had landed without incident, and yes, there were sixteen each. Brill shuffled a couple of squads to conform to the enemy's troop concentration, and we waited.

They moved fast across the mine field, striding in unison like bowlegged, top-heavy robots, not even breaking stride when one of them was blown to bits by a mine, which happened eleven times.

When they came over the horizon, the reason for their apparently random distribution was obvious: they had analyzed beforehand which approaches would give them the most natural cover, from the rubble that the drones had kicked up. They would be able to get within a couple of kilometers of the base before we got any clear line-of-sight on them. And their suits had augmentation circuits similar to ours, so they could cover a kilometer in less than a minute.

Brill had her troops open fire immediately, probably more for morale than out of any hope of actually hitting the enemy. They probably were getting a few, though it was hard to tell. At least the tachyon rockets did an impressive job of turning boulders into gravel.

The Taurans returned fire with some weapon similar to the tachyon rocket, maybe exactly the same. They rarely found a mark, though; our people were at and below ground level, and if the rocket didn't hit something it would keep on going forever, amen. They did score a hit on one of the bevawatt lasers, though, and the concussion that filtered down to us was strong enough to make me wish we had burrowed a little deeper than twenty meters.

The bevawatts weren't doing us any good. The Taurans must have figured out the lines of sight ahead of time, and gave them wide berth. That turned out to be fortunate, because it caused Charlie to let his attention wander from the laser monitors for a moment.

"What the hell?"

"What's that, Charlie?" I didn't take my eyes off the monitors. Waiting for something to happen.

"The ship, the cruiser—it's gone." I looked at the holograph display. He was right, the only red lights were those that stood for the troop carriers.

"Where did it go?" I asked inanely.

"Let's play it back." He programmed the display to go back a couple of minutes and cranked out the scale to where both planet and collapsar showed on the cube. The cruiser showed up, and with it, three green dots. Our "coward," attacking the cruiser with only two drones.

But he had a little help from the laws of physics.

Instead of going into collapsar insertion, he had skimmed *around* the collapsar field in a slingshot orbit. He had come out going .9 *c*; the drones were going .99 *c*, headed straight for the enemy cruiser. Our planet was about a thousand light-seconds from the collapsar, so the Tauran ship had only ten seconds to detect and stop both drones. And at that speed, it didn't matter whether you'd been hit by a nova bomb or a spitball.

The first drone disintegrated the cruiser and the other one, .01 second behind, glided on down to impact on the planet. The fighter missed the planet by a couple of hundred kilometers and hurtled on into space, decelerating with the maximum twenty-five G's. He'd be back in a couple of months.

But the Taurans weren't going to wait. They were getting close enough to our lines for both sides to start using lasers, but they were also within easy grenade range. A good-sized rock could shield them

from laser fire, but the grenades and rockets were slaughtering them.

At first, Brill's troops had the overwhelming advantage; fighting from ditches, they could only be harmed by an occasional lucky shot or an extremely well-aimed grenade (which the Taurans threw by hand, with a range of several hundred meters). Brill had lost four, but it looked as if the Tauran force was down to less than half its original size.

Eventually, the landscape had been torn up enough so that the bulk of the Tauran force was also able to fight from holes in the ground. The fighting slowed down to individual laser duels, punctuated occasionally by heavier weapons. But it wasn't smart to use up a tachyon rocket against a single Tauran, not with another force of unknown size only a few minutes away.

Something had been bothering me about that holographic replay. Now, with the battle's lull, I knew what it was.

When that second drone crashed at near-light-speed, how much damage had it done to the planet? I stepped over to the computer and punched it up; found out how much energy had been released in the collision, and then compared it with geological information in the computer's memory.

Twenty times as much energy as the most powerful earthquake ever recorded. On a planet three-quarters the size of Earth.

On the general frequency: "Everybody—topside! Right now!" I palmed the button that would cycle and open the airlock and tunnel that led from Administration to the surface.

"What the hell, Will—"

"Earthquake!" How long? "Move!"

Hilleboe and Charlie were right behind me.

"Safer in the ditches?" Charlie said.

"I don't know," I said. "Never been in an earthquake." Maybe the walls of the ditch would close up and crush you.

I was surprised at how dark it was on the surface. S Doradus had almost set; the monitors had compensated for the low light level.

An enemy laser raked across the clearing to our left, making a quick shower of sparks when it flicked by a bevawatt mounting. We hadn't been seen yet. We all decided yes, it would be safer in the ditches, and made it to the nearest one in three strides.

There were four men and women in the ditch, one of them badly wounded or dead. We scrambled down the ledge and I turned up my image amplifier to log two, to inspect our ditchmates. We were lucky; one was a grenadier and they also had a rocket launcher. I could just make out the names on their helmets. We were

in Brill's ditch, but she hadn't noticed us yet. She was at the opposite end, cautiously peering over the edge, directing two squads in a flanking movement. When they were safely in position, she ducked back down. "Is that you, Major?"

"That's right," I said cautiously. I wondered whether any of the people in the ditch were among the ones after my scalp.

"What's this about an earthquake?"

She had been told about the cruiser being destroyed, but not about the other drone. I explained in as few words as possible.

"Nobody's come out of the airlock," she said. "Not yet. I guess they all went into the stasis field."

"Yeah, they were just as close to one as the other." Maybe some of them were still down below, hadn't taken my warning seriously. I chinned the general frequency to check, and then all hell broke loose.

The group dropped away and then flexed back up; slammed us so hard that we were airborne, tumbling out of the ditch. We flew several meters, going high enough to see the pattern of bright orange and yellow ovals, the craters where nova bombs had been stopped. I landed on my feet but the ground was shifting and slithering so much that it was impossible to stay upright.

With a basso grinding I could feel through my suit, the cleared area above our base crumbled and fell in. Part of the stasis field's underside was exposed when the ground subsided; it settled to its new level with aloof grace.

I hoped everybody had had time and sense enough to get under the dome.

A figure came staggering out of the ditch nearest to me and I realized with a start that it wasn't human. At this range, my laser burned a hole straight through his helmet; he took two steps and fell over backward. Another helmet peered over the edge of the ditch. I sheared the top of it off before he could raise his weapon.

I couldn't get my bearings. The only thing that hadn't changed was the stasis dome, and it looked the same from any angle. The bevawatt lasers were all buried, but one of them had switched on, a brilliant flickering searchlight that illuminated a swirling cloud of vaporized rock.

Obviously, though, I was in enemy territory. I started across the trembling ground toward the dome.

I couldn't raise any platoon leaders. All of them but Brill were probably inside the dome. I did get Hilleboe and Charlie; told Hilleboe to go inside the dome and roust everybody out. If the next wave also had 128, we were going to need everybody.

The tremors died down and I found my way into a "friendly" ditch—the cooks' ditch, in fact,

since the only people there were Orban and Rudkoski.

I got a beep from Hilleboe and chinned her on. "Sir . . . there were only ten people there. The rest didn't make it."

"They stayed behind?" Seemed like they'd had plenty of time.

"I don't know, sir."

"Never mind. Get me a count, how many people we have, all totaled." I tried the platoon leaders' frequency again and it was still silent.

The three of us watched for enemy laser fire, for a couple of minutes, but there was none. Probably waiting for reinforcements.

Hilleboe called back. "I only get fifty-three, sir. Some others may be unconscious."

"All right. Have them sit tight until—" Then the second wave showed up, the troop carriers roaring over the horizon with their jets pointed our way, decelerating. *"Get some rockets on those bastards!"* Hilleboe yelled to everyone in particular. But nobody had managed to stay attached to a rocket launcher while he was being tossed around. No grenade launchers, either, and the range was too far for the hand lasers to do any damage.

These carriers were four or five times the size of the ones in the first wave. One of them grounded about a kilometer in front of us, barely stopping long enough to disgorge its troops. Of which there were over fifty, probably sixty-four—times eight made 512. No way we could hold them back.

"Everybody listen, this is Major Mandella." I tried to keep my voice even and quiet. "We're going to retreat back into the dome, quickly but in an orderly way. I know we're scattered all over hell. If you belong to the second or fourth platoon, stay put for a minute and give covering fire while the first and third platoons, and support, fall back.

"First and third and support, fall back to about half your present distance from the dome, then take cover and defend the second and fourth as they come back. They'll go to the edge of the dome and cover you while you come back the rest of the way." I shouldn't have said "retreat"; that word wasn't in the book. Retrograde action.

There was a lot more retrograde than action. Eight or nine people were firing, and all the rest were in full flight. Rudkoski and Orban had vanished. I took a few carefully aimed shots, to no great effect, then ran down to the other end of the ditch, climbed out and headed for the dome.

The Taurans started firing rockets, but most of them seemed to be going too high. I saw two of us get blown away before I got to my half-way point; found a nice big rock and hid behind it. I peeked out and decided that only two or three of the Taurans were close enough to be even remotely pos-

sible laser targets, and the better part of valor would be in not drawing unnecessary attention to myself. I ran the rest of the way to the edge of the field and stopped to return fire. After a couple of shots, I realized that I was just making myself a target; as far as I could see there was only one other person who was still running toward the dome.

A rocket zipped by, so close I could have touched it. I flexed my knees and kicked, and entered the dome in a rather undignified posture.

3.

Inside, I could see the rocket that had missed me drifting lazily through the gloom, rising slightly as it passed through to the other side of the dome. It would vaporize the instant it came out the other side, since all of the kinetic energy it had lost in abruptly slowing down to 16.3 meters per second would come back in the form of heat.

Nine people were lying dead, face-down just inside of the field's edge. It wasn't unexpected, though it wasn't the sort of thing you were supposed to tell the troops.

Their fighting suits were intact—otherwise they wouldn't have made it this far—but sometime during the past few minutes' rough-and-tumble, they had damaged the coating of special insulation that protected them from the stasis field. So as soon as they entered the field, all electrical activity in their bodies ceased, which killed them instantly. Also, since no molecule in their bodies could move faster than 16.3 m/sec, they instantly froze solid, their body temperatures stabilized at a cool 0.426° Absolute.

I decided not to turn any of them over to find out their names, not yet. We had to get some sort of defensive position worked out, before the Taurans came through the dome. If they decided to slug it out rather than wait.

With elaborate gestures, I managed to get everybody collected in the center of the field, under the fighter's tail, where the weapons were racked.

There were plenty of weapons, since we had been prepared to outfit three times this number of people. After giving each person a shield and short-sword, I traced a question in the snow: GOOD ARCHERS? RAISE HANDS. I got five volunteers, then picked out three more so that all the bows would be in use. Twenty arrows per bow. They were the most effective long-range weapon we had; the arrows were almost invisible in their slow flight, heavily weighted and tipped with a deadly sliver of diamond-hard crystal.

I arranged the archers in a circle around the fighter (its landing fins would give them partial protection from missiles coming in from behind) and between each pair of

archers put four other people: two spear-throwers, one quarterstaff, and a person armed with battleax and a dozen chakram throwing knives. This arrangement would theoretically take care of the enemy at any range from the edge of the field to hand-to-hand combat.

Actually, at some 600-to-42 odds, they could probably walk in with a rock in each hand, no shields or special weapons, and still beat the crap out of us.

Assuming they knew what the stasis field was. Their technology seemed up to date in all other respects.

For several hours nothing happened. We got about as bored as anyone could, waiting to die. No one to talk to, nothing to see but the unchanging gray dome, gray snow, gray space-ship and a few identically gray soldiers. Nothing to hear, taste or smell but yourself.

Those of us who still had any interest in the battle were keeping watch on the bottom edge of the dome, waiting for the first Taurans to come through. So it took us a second to realize what was going on when the attack did start. It came from above, a cloud of catapulted darts swarming in through the dome some thirty meters above the ground, headed straight for the center of the hemisphere.

The shields were big enough that you could hide most of your body behind them by crouching slightly; the people who saw the darts coming could protect themselves easily. The ones who had their backs to the action, or were just asleep at the switch, had to rely on dumb luck for survival; there was no way to shout a warning, and it only took three seconds for a missile to get from the edge of the dome to its center.

We were lucky, losing only five. One of them was an archer, Shubik. I took over her bow and we waited, expecting a ground attack immediately.

It didn't come. After a half-hour, I went around the circle and explained with gestures that the first thing you were supposed to do, if anything happened, was to touch the person on your right. He'd do the same, and so on down the line.

That might have saved my life. The second dart attack, a couple of hours later, came from behind me. I felt the nudge, slapped the person on my right, turned around and saw the cloud descending. I got the shield over my head and they hit a split-second later.

I set down my bow to pluck three darts from the shield and the ground attack started.

It was a weird, impressive sight. Some three hundred of them stepped into the field simultaneously, almost shoulder-to-shoulder around the perimeter of the dome. They advanced in step, each one holding a round shield barely large enough to hide his massive chest. They were throwing darts

similar to the ones we had been barraged with.

I set the shield up in front of me—it had little extensions on the bottom to keep it upright—and with the first arrow I shot, I knew we had a chance. It struck one of them in the center of his shield, went straight through and penetrated his suit.

It was a one-sided massacre. The darts weren't very effective without the element of surprise—but when one came sailing over my head from behind, it did give me a crawly feeling between the shoulderblades.

With twenty arrows I got twenty Taurans. They closed ranks every time one dropped; you didn't even have to aim. After running out of arrows, I tried throwing their darts back at them. But their light shields were quite adequate against the small missiles.

We'd killed more than half of them with arrows and spears, long before they got into range of the hand-to-hand weapons. I drew my sword and waited. They still outnumbered us by better than three to one.

When they got within ten meters, the people with the chakram throwing knives had their own field day. Although the spinning disc was easy enough to see, and it took more than a half-second to get from thrower to target, most of the Taurans reacted the same ineffective way, raising up the shield to ward it off. The razor-sharp, tempered heavy blade cut through the light shield like a buzz-saw through cardboard.

The first hand-to-hand contact was with the quarterstaffs, which were metal rods two meters long, that tapered at the ends to a double-edged, serrated knife blade. The Taurans had a cold-blooded—or valiant, if your mind works that way—method for dealing with them. They would simply grab the blade and die. While the human was trying to extricate his weapon from the frozen death-grip, a Tauran swordsman, with a scimitar over a meter long, would step in and kill him.

Besides the swords, they had a bolo-like thing that was a length of elastic cord that ended with about ten centimeters of something like barbed wire, and a small weight to propel it. It was a dangerous weapon for all concerned; if they missed their target it would come snapping back unpredictably. But they hit their target pretty often, going under the shields and wrapping the thorny wire around ankles.

I stood back-to-back with Private Erikson and with our swords we managed to stay alive for the next few minutes. When the Taurans were down to a couple of dozen survivors, they just turned around and started marching out. We threw some darts after them, getting three, but we didn't want to chase after them. They might turn

around and start hacking again.

There were only twenty-eight of us left standing. Nearly ten times that number of dead Taurans littered the ground, but there was no satisfaction in it.

They could do the whole thing over, with a fresh 300. And this time it would work.

We moved from body to body, pulling out arrows and spears, then took up places around the fighter again. Nobody bothered to retrieve the quarterstaffs. I counted noses: Charlie and Diana were still alive (Hilleboe had been one of the quarterstaff victims) as well as two supporting officers, Wilber and Szydlowska. Rudkoski was still alive but Orban had taken a dart.

After a day of waiting, it looked as if the enemy had decided on a war of attrition, rather than repeating the ground attack. Darts came in constantly, not in swarms anymore, but in twos and threes and tens. And from all different angles. You couldn't stay alert forever; they'd get somebody every three or four hours.

We took turns sleeping, two at a time, on top of the stasis field generator. Sitting directly under the bulk of the fighter, it was the safest place in the dome.

Every now and then, a Tauran would appear at the edge of the field, evidently to see whether any of us were left. Sometimes we'd shoot an arrow at him, for practice.

The darts stopped falling after a couple of days. I supposed it was possible that they'd simply run out of them. Or maybe they'd decided to stop when we were down to twenty survivors.

There was a more likely possibility. I took one of the quarterstaffs down to the edge of the field and poked it through, a centimeter or so. When I drew it back, the point was melted off. When I showed it to Charlie, he just rocked back and forth (the only way you can nod in a suit); this sort of thing had happened before, one of the first times the stasis field hadn't worked. They simply saturated it with laser fire and waited for us to go stir-crazy and turn off the generator. They were probably sitting in their ships playing the Tauran equivalent of pinochle.

I tried to think. It was hard to keep your mind on something for any length of time in that hostile environment, sense-deprived, looking over your shoulder every few seconds. Something Charlie had said. Only yesterday. I couldn't track it down. It wouldn't have worked then; that was all I could remember. Then finally it came to me.

I called everyone over and wrote in the snow:

GET NOVA BOMBS FROM SHIP.

CARRY TO EDGE OF FIELD.

MOVE FIELD.

Szydlowska knew where the proper tools would be, aboard ship.

Luckily, we had left all of the entrances open before turning on the stasis field; they were electronic and would have been frozen shut. We got an assortment of wrenches from the engine room and climbed up to the cockpit. He knew how to remove the access plate that exposed a crawl space into the bomb-bay. I followed him in through the meter-wide tube.

Normally, I supposed, it would have been pitch-black. But the stasis field illuminated the bomb-bay with the same dim, shadowless light that prevailed outside. The bomb-bay was too small for both of us, so I stayed at the end of the crawl space and watched.

The bomb-bay doors had a "manual override" so they were easy; Szydlowska just turned a hand-crank and we were in business. Freeing the two nova bombs from their cradles was another thing. Finally, he went back down to the engine room and brought back a crowbar. He pried one loose and I got the other, and we rolled them out the bomb-bay.

Sergeant Anghelov was already working on them by the time we climbed back down. All you had to do to arm the bomb was to unscrew the fuse on the nose of it and poke something around in the fuse socket to wreck the delay mechanism and safety restraints.

We carried them quickly to the edge, six people per bomb, and set them down next to each other. Then we waved to the four people who were standing by at the field generator's handles. They picked it up and walked ten paces in the opposite direction. The bombs disappeared as the edge of the field slid over them.

There was no doubt that the bombs had gone off. For a couple of seconds it was hot as the interior of a star outside, and even the stasis field took notice of the fact: about a third of the dome glowed a dull pink for a moment, then was gray again. There was a slight acceleration, like you would feel in a slow elevator. That meant we were drifting down to the bottom of the crater. Would there be a solid bottom? Or would we sink down through molten rock to be trapped like a fly in amber—didn't pay to even think about that. Perhaps if it happened, we could blast our way out with the fighter's bevawatt laser.

Twelve of us, anyhow.

HOW LONG? Charlie scraped in the snow at my feet.

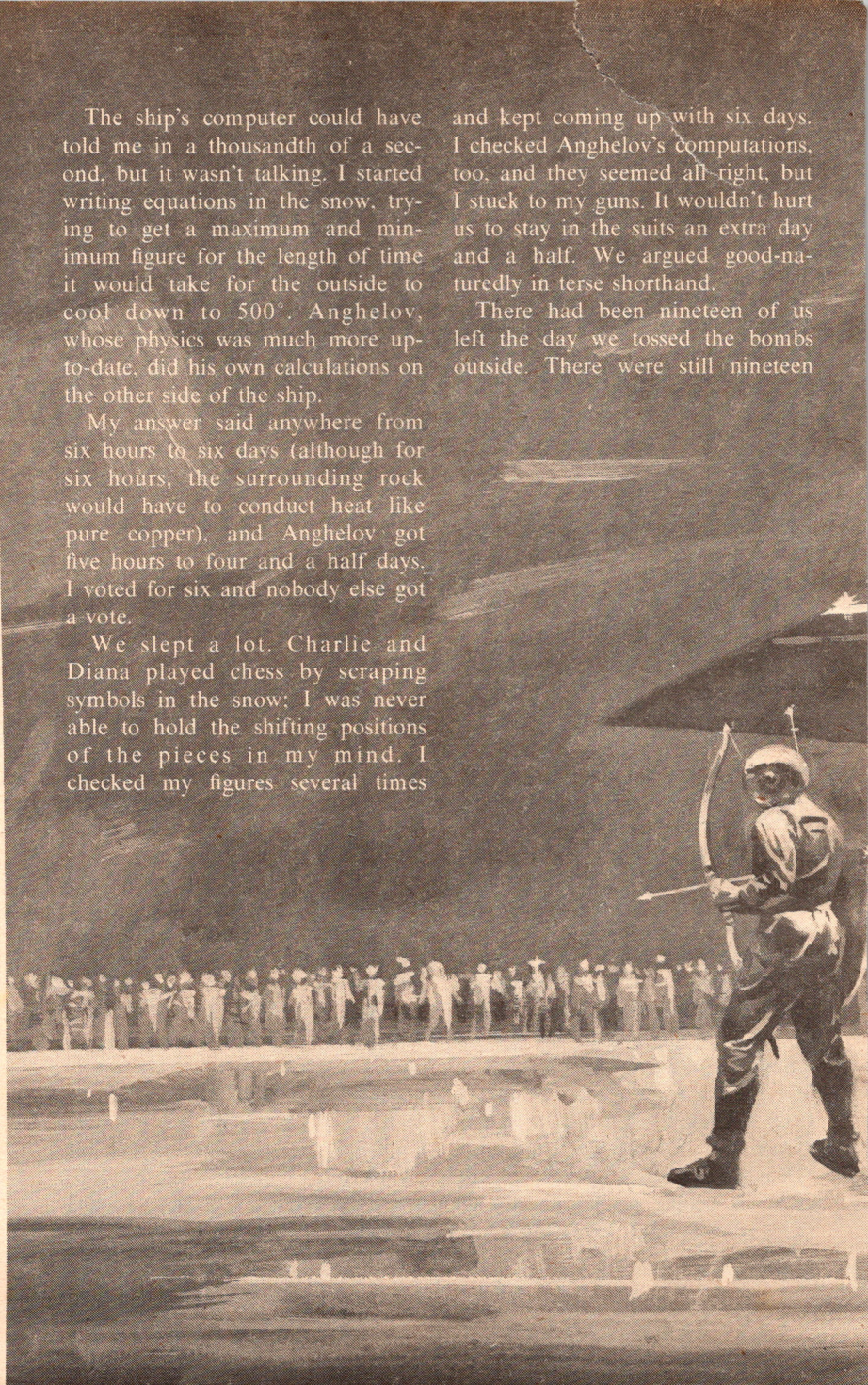
That was a damned good question. About all I knew was the amount of energy two nova bombs released. I didn't know how big a fireball they would make, which would determine the temperature at detonation and the size of the crater. I didn't know the heat capacity of the surrounding rock, or its boiling point. I wrote ONE WEEK, SHRUG? HAVE TO THINK.

The ship's computer could have told me in a thousandth of a second, but it wasn't talking. I started writing equations in the snow, trying to get a maximum and minimum figure for the length of time it would take for the outside to cool down to 500°. Anghelov, whose physics was much more up-to-date, did his own calculations on the other side of the ship.

My answer said anywhere from six hours to six days (although for six hours, the surrounding rock would have to conduct heat like pure copper), and Anghelov got five hours to four and a half days. I voted for six and nobody else got a vote.

We slept a lot. Charlie and Diana played chess by scraping symbols in the snow; I was never able to hold the shifting positions of the pieces in my mind. I checked my figures several times and kept coming up with six days. I checked Anghelov's computations, too, and they seemed all right, but I stuck to my guns. It wouldn't hurt us to stay in the suits an extra day and a half. We argued good-naturedly in terse shorthand.

There had been nineteen of us left the day we tossed the bombs outside. There were still nineteen



six days later, when I paused with my hand over the generator's cutoff switch. What was waiting for us out there? Surely we had killed all the Taurans within several klicks of the explosion. But there might have been a reserve force farther away, now waiting patiently on the crater's lip. At least you could push a quarterstaff through the field and have it come back whole.

I dispersed the people evenly around the area, so they might not get us with a single shot. Then, ready to turn it back on immediately if anything went wrong, I pushed.

4.

My radio was still tuned to the general frequency; after more than a week of silence my ears were suddenly assaulted with loud, happy babbling.

We stood in the center of a crater almost a kilometer wide and deep. Its sides were a shiny black crust shot through with red cracks, hot but no longer dangerous. The hemisphere of earth that we rested on had sunk a good forty meters into the floor of the crater, while it had still been molten, so now we stood on a kind of pedestal.

Not a Tauran in sight.

We rushed to the ship, sealed it and filled it with cool air and popped our suits. I didn't press seniority for the one shower; just sat back in an acceleration couch and took deep breaths of air that didn't smell like recycled Mandella.

The ship was designed for a maximum crew of twelve, so we stayed outside in shifts of seven to keep from straining the life support systems. I sent a repeating message to the other fighter, which was still over six weeks away, that we were in good shape and waiting to be picked up. I was reasonably certain he would have seven free berths, since the normal crew for a combat mission was only three.

It was good to walk around and talk again. I officially suspended all things military for the duration of our stay on the planet. Some of the people were survivors of Brill's mutinous bunch, but they didn't show any hostility toward me.

We played a kind of nostalgia game, comparing the various eras we'd experienced on Earth, wondering what it would be like in the 700-years-future we were going back to. Nobody mentioned the fact that we would at best go back to a few months' furlough, and then be assigned to another Strike Force, another turn of the wheel.

Wheels. One day Charlie asked me from what country my name originated; it sounded weird to him. I told him it originated from the lack of a dictionary and that if it were spelled right, it would look even weirder.

I got to kill a good half-hour explaining all the peripheral details to that. Basically, though, my parents were "hippies" (a kind of sub-

culture in late Twentieth Century America, that rejected materialism and embraced a broad spectrum of odd ideas) who lived with a group of other hippies in a small agricultural community. When my mother got pregnant, they wouldn't be so conventional as to get married: this entailed the woman taking the man's name, and implied that she was his property. But they got all intoxicated and sentimental and decided they would both change their names to be the same. They rode into the nearest town, arguing all the way as to what name would be the best symbol for the love-bond between them—I narrowly missed having a much shorter name—and they settled on Mandala.

A mandala is a wheel-like design the hippies had borrowed from a foreign religion, that symbolized the cosmos, the cosmic mind, God, or whatever needed a symbol. Neither my mother nor my father really knew how to spell the word, and the magistrate in town just wrote it down the way it sounded to him. And they named me William in honor of a wealthy uncle, who unfortunately died penniless.

The six weeks passed rather pleasantly; talking, reading, resting. The other ship landed next to ours and did have nine free berths. We shuffled crews so that each ship had someone who could get it out of trouble if the preprogrammed jump sequence malfunctioned. I assigned myself to the other ship, hoping it would have some new books. It didn't.

We zipped up in the tanks and took off simultaneously.

We wound up spending a lot of time in the tanks, just to keep from looking at the same faces all day long in the crowded ship. The added periods of acceleration got us back to Stargate in ten months, subjective. Of course it was still 340 years (minus seven months) to the hypothetical objective observer.

There were hundreds of cruisers in orbit around Stargate. Bad news: with that kind of backlog we probably wouldn't get any furlough at all.

I supposed I was more likely to get a court martial than a furlough, anyhow. Losing eighty-eight percent of my company, many of them because they didn't have enough confidence in me to obey that direct earthquake order. And we were back where we'd started on Sade-138; no Taurans there but no base, either.

We got landing instructions and went straight down, no shuttle. There was another surprise waiting at the spaceport. More dozens of cruisers were standing around on the ground—they'd never done that before for fear that Stargate would be hit—and two captured Tauran cruisers as well. We'd never managed to get one intact.

Seven centuries could have brought us a decisive advantage, of

course. Maybe we were winning.

We went through an airlock under a "returnees" sign. After the air cycled and we'd popped our suits, a beautiful young woman came in with a cartload of tunics and told us, in perfectly-accented English, to get dressed and go to the lecture hall at the end of the corridor to our left.

The tunic felt odd, light yet warm. It was the first thing I'd worn besides a fighting suit or bare skin in almost a year.

The lecture hall was about a hundred times too big for the twenty-two of us. The same girl was there, and asked us to move down to the front. That was unsettling; I could have sworn she had gone down the corridor the other way—I *knew* she had; I'd been captivated by the sight of her clothed behind.

Hell, maybe they had matter transmitters. Or teleportation. Wanted to save herself a few steps.

We sat for a minute and a man, clothed in the same kind of unadorned tunic we and the girl were wearing, walked across the stage with a stack of thick notebooks under each arm.

The same girl followed him on, also carrying notebooks.

I looked behind me and she was still standing in the aisle. To make things even more odd, the man was virtually a twin to both of the women.

The man riffled through one of the notebooks and cleared his throat. "These books are for your convenience," he said, also with perfect accent, "and you don't have to read them if you don't want to. You don't have to do anything you don't want to do, because . . . you're free men and women. The war is over."

Disbelieving silence.

"As you will read in this book, the war ended 221 years ago. Accordingly, this is the year 220. Old style, of course, it is 3138 AD.

"You are the last group of soldiers to return. When you leave here, I will leave as well. And destroy Stargate. It exists only as a rendezvous point for returnees, and as a monument to human stupidity. And shame. As you will read. Destroying it will be a cleansing."

He stopped speaking and the woman started without a pause. "I am sorry for what you've been through and wish I could say that it was for good cause, but as you will read, it was not.

"Even the wealth you have accumulated, back salary and compound interest, is worthless, as I no longer use money or credit. Nor is there such a thing as an economy, in which to use these . . . things."

"As you must have guessed by now," the man took over, "I am, we are, clones of a single individual. Some 250 years ago, my name was Kahn. Now it is Man.

"I had a direct ancestor in your company, a Corporal Larry Kahn.

It saddens me that he didn't come back."

"I am over ten billion individuals but only one consciousness," she said. "After you read, I will try to clarify this. I know that it will be difficult to understand.

"No other humans are quickened, since I am the perfect pattern. Individuals who die are replaced. There are planets, however, on which humans are born in the normal, mammalian way. If my society is too alien for you, you may go to one of these planets. If you wish to take part in procreation, we will not discourage it. Many veterans ask us to change their polarity to heterosexual so that they can more easily fit into these other societies. This I can do very easily."

Don't worry about that, Man, just make out my ticket.

"You will be my guest here at Stargate for ten days, after which you will be taken wherever you want to go," he said. "Please read this book in the meantime. Feel free to ask any questions, or request any service." They both stood and walked off the stage.

Charlie was sitting next to me. "Incredible," he said. "They let . . . they encourage . . . men and women to do *that* again? Together?"

The female aisle Man was sitting behind us, and she answered before I could frame a reasonably sympathetic, hypocritical reply. "It isn't a judgment on your society," she said, probably not seeing that he took it a little more personally than that. "I only feel that it's necessary as a eugenic safety device. I have no evidence that there is anything wrong with cloning only one ideal individual, but if it turns out to have been a mistake, there will be a large genetic pool with which to start again."

She patted him on the shoulder. "Of course, you don't have to go to these breeder planets. You can stay on one of my planets. I make no distinction between heterosexual play and homosexual."

She went up on the stage to give a long spiel about where we were going to stay and eat and so forth while we were on Stargate. "Never been seduced by a computer before," Charlie muttered.

The 1143-year-long war had been begun on false pretenses and only continued because the two races were unable to communicate.

Once they could talk, the first question was "Why did you start this thing?" and the answer was "Me?"

The Taurans hadn't known war for millennia, and toward the beginning of the Twenty-first Century it looked as if mankind was ready to outgrow the institution as well. But the old soldiers were still around, and many of them were in positions of power. They virtually ran the United Nations Exploratory

and Colonization Group, that was taking advantage of the newly-discovered collapsar jump to explore interstellar space.

Many of the early ships met with accidents and disappeared. The ex-military men were suspicious. They armed the colonizing vessels and the first time they met a Tauran ship, they blasted it.

They dusted off their medals and the rest was going to be history.

You couldn't blame it all on the military, though. The evidence they presented for the Taurans' having been responsible for the earlier casualties was laughably thin. The few people who pointed this out were ignored.

The fact was, Earth's economy needed a war, and this one was ideal. It gave a nice hole to throw buckets of money into, but would unify humanity rather than divide it.

The Taurans relearned war, after a fashion. They never got really good at it, and would eventually have lost.

The Taurans, the book explained, couldn't communicate with humans because they had no concept of the individual; they had been natural clones for millions of years. Eventually, Earth's cruisers were manned by Man, Kahn-clones, and they were for the first time able to get through to each other.

The book stated this as a bald fact. I asked a Man to explain what it meant, what was special about clone-to-clone communication, and he said that I *a priori* couldn't understand it. There were no words for it, and my brain wouldn't be able to accommodate the concepts even if there were words.

All right. It sounded a little fishy, but I was willing to accept it. I'd accept that up was down if it meant the war was over.

I'd just finished dressing after my first good night's sleep in years, when someone tapped lightly on my door. I opened it and it was a female Man, standing there with an odd expression on her face. Almost a leer; was she trying to look seductive?

"Major Mandella," she said, "may I come in?" I motioned her to a chair but she went straight to the bed and sat daintily on the rumpled covers.

"I have a proposition for you, Major." I wondered whether she knew the word's archaic second meaning. "Come sit beside me, please."

Lacking Charlie's reservations about being seduced by a computer, I sat. "What do you propose?" I touched her warm thigh and found it disappointingly easy to control myself. Can reflexes get out of practice?

"I need permission to clone you, and a few grams of flesh. In return, I offer you immortality."

Not the proposition I'd expected.

"Why me? I thought you were already the perfect pattern."

"For my own purposes, and within my powers to judge, I am. But I need you for a function . . . contrary to my own nature. And contrary to my Tauran brother's nature."

"A nasty job." Spend all eternity cleaning out the sewers; immortality of a sort.

"You might not find it so." She shifted restlessly and I removed my hand. "Thank you. You have read the first part of the book?"

"Scanned it."

"Then you know that both Man and Tauran are gentle beings. We do not fight among ourselves or with each other, because physical aggressiveness has been bred out of our sensibilities. Engineered out."

"A laudable accomplishment." I saw where this was leading and the answer was going to be no.

"But it was just this lack of aggressiveness that allowed Earth, in your time, to successfully wage war against a culture uncountable millennia older. I am afraid it could happen again."

"This time to Man."

"Man and Tauran; philosophically there is little difference."

"What you want, then, is for me to provide you with an army. A band of barbarians to guard your frontiers."

"That's an unpleasant way of—"

"It's not a pleasant idea." My idea of hell. "No. I can't do it."

"Your only chance to live forever."

"Absolutely not." I stared at the floor. "Your aggressiveness was bred out of you. Mine was knocked out of me."

She stood up and smoothed the tunic over her perfect hips. "I cannot use guile. I will not withhold this body from you, if you desire it."

I considered that but didn't say anything.

"Besides immortality, all I can offer you is the abstract satisfaction of service. Protecting humanity against unknown perils."

I'd put in my thousand-odd years of service, and hadn't got any great satisfaction. "No. Even if I thought of you as humanity, the answer would still be no."

She nodded and went to the door.

"Don't worry," I said. "You can get one of the others."

She opened the door and addressed the corridor outside. "No, the others have already declined. You were the least likely, and the last one I approached."

Man was pretty considerate, especially so in light of our refusal to cooperate. Just for us twenty-two throwbacks, he went to the trouble of rejuvenating a little restaurant/tavern and staffing it at all hours (I never saw a Man eat or drink—guess they'd discovered a way around it). I was sitting in

there one evening, drinking beer and reading their book, when Charlie came in and sat down.

Without preamble, he said, "I'm going to give it a try."

"Give what a try?"

"Women. Hetero." He shuddered. "No offense . . . it's not really very appealing." He patted my hand, looking distracted. "But the alternative . . . have you tried it?"

"Well . . . no, I haven't." Female Man was a visual treat, but only in the same sense as a painting or a piece of sculpture. I just couldn't see them as human beings.

"Don't." He didn't elaborate. "Besides, they say—he says, she says, it says—that they can change me back just as easily. If I don't like it."

"You'll like it, Charlie."

"Sure, that's what *they* say." He ordered a stiff drink. "Just seems unnatural. Anyway, since, uh, I'm going to make the switch, do you mind if . . . why don't we plan on going to the same planet?"

"Sure, Charlie, that'd be great." I meant it. "You know where you're going?"

"Hell, I don't care. Just away from here."

"I wonder if Heaven's still as nice—"

"No." Charlie jerked a thumb at the bartender. "*He* lives there."

"I don't know. I guess there's a list."

A Man came into the tavern, pushing a car piled high with folders. "Major Mandella? Captain Moore?"

"That's us," Charlie said.

"These are your military records. I hope you find them of interest. They were transferred to paper when your Strike Force was the only one outstanding, because it would have been impractical to keep the normal data retrieval networks running to preserve so few data."

They always anticipated your questions, even when you didn't have any.

My folder was easily five times as thick as Charlie's. Probably thicker than any other, since I seemed to be the only trooper who'd made it through the whole duration. Poor Marygay. "Wonder what kind of report old Stott filed about me." I flipped to the front of the folder.

Stapled to the front page was a small square of paper. All the other pages were pristine white, but this one was tan with age and crumbling around the edges.

The handwriting was familiar, too familiar even after so long. The date was over 250 years old.

I winced and was blinded by sudden tears. I'd had no reason to suspect that she might be alive. But I hadn't really known she was dead, not until I saw that date.

"William? What's—"

"Leave me be, Charlie. Just for a minute." I wiped my eyes and closed the folder. I shouldn't even

read the damned note. Going to a new life, I should leave old ghosts behind.

But even a message from the grave was contact of a sort. I opened the folder again.

11 Oct 2878

William–

All this is in your personnel file. But knowing you, you might just chuck it. So I made sure you'd get this note.

Obviously, I lived. Maybe you will, too. Join me.

I know from the records that you're out at Sade-138 and won't be back for a couple of centuries. No problem.

I'm going to a planet they call Middle Finger, the fifth planet out from Mizar. It's two collapsar jumps, ten months subjective. Middle Finger is a kind of Coventry for heterosexuals. They call it a "eugenic control baseline."

No matter. It took all of my money, and all the money of five other old-timers, but we bought a cruiser from UNEF. And we're using it as a time machine.

So I'm on a relativistic shuttle, waiting for you. All it does is go out five light-years and come back to Middle Finger, very fast. Every ten years I age about a month. So if you're on schedule and still alive, I'll only be twenty-eight when you get here. Hurry!

I never found anybody else and I don't want anybody else. I don't care whether you're ninety years old or thirty. If I can't be your lover, I'll be your nurse.

–Marygay

"Say, bartender."

"Yes, Major?"

"Do you know of a place called Middle Finger? Is it still there?"

"Of course it is. Where would it be?" Reasonable question. "A very nice place. Garden planet. Some people don't think it's exciting enough."

"What's this all about?" Charlie said.

I handed the bartender my empty glass. "I just found out where we're going."

5. Epilog

From *The New Voice,*
Paxton, Middle Finger 24-6
14/2/3143

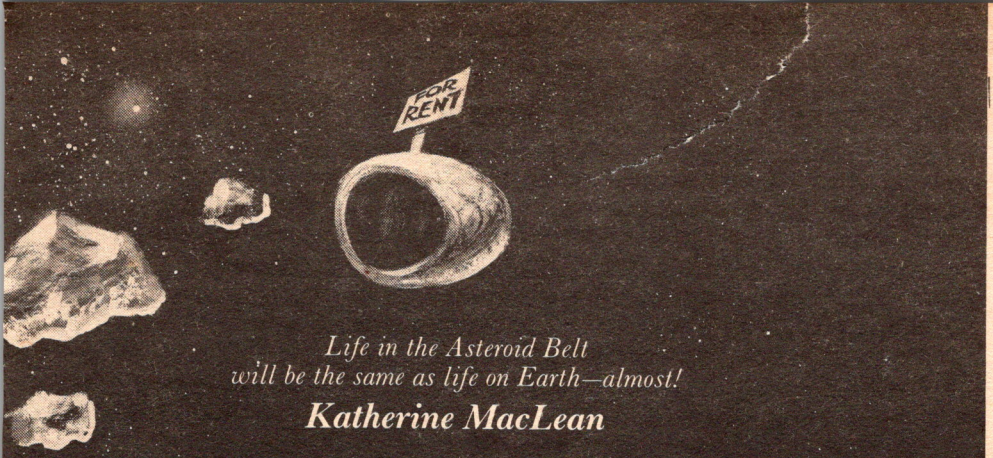
OLD-TIMER HAS FIRST BOY

Marygay Potter-Mandella (24 Post Road, Paxton) gave birth Friday last to a fine baby boy, 3.1 kilos.

Marygay lays claim to being the second-"oldest" resident of Middle Finger, having been born in 1977. She fought through most of the Forever War and then waited for her mate on the time shuttle, 261 years. Her mate, William Mandella-Potter, is two years older.

The baby, not yet named, was delivered at home with the help of a friend of the family, Dr. Diana Alsever-Moore. ■

Kelly Freas



Life in the Asteroid Belt will be the same as life on Earth—almost!

Katherine MacLean

Abe was getting too big for the home barrel. He was six-foot-four and maybe still growing, and when he stood up straight his head was up past spin center in the barrel and spin gravity was pulling his head the other way. He said it made him feel dizzy and upside down.

We were sorry the barrel was so small but we couldn't calculate any way to make it bigger, so Abe sat down a lot. When he sat down he stretched out his legs, and his legs were long legs and we tripped over him coming and going.

Ma always swore she'd never let any son of hers work at the Belt Foundry, not with those rowdy drinking men and their sinful shows in their recreation lounge, and their trips to the Gambling Hells on the Moon. She said they were bad company for a Christian. But then she tripped over Abe's legs while she was carrying a pot of stew to the table.

Well, we all ran over to help clean up, and the piglets helped the most, even licking up the spots, but Ma got up mad with her mouth zipped tight closed and went back to the solar oven to cook up something else. She didn't say a thing all the time she was cooking, like she was thinking. When she had a good hot meal of fish and potatoes out on the table she sat down with us and said the blessing and served us each out a helping, and then said what she'd been thinking.

"Abe, why don't you get a job at the Belt Foundry? They've got big rooms with a spin center a lot higher than you. And I hear they have all the books that was ever written in their readout library."

I'm just eleven, and Abe hardly notices me among the parcel of other kids, but I'd been yearning after the fine, free rich life of a Belt Foundry Engineer in my heart so I knew how Abe felt. He'd never let Ma know he'd been yearning after it and keeping silent, but he went around the table and gathered her up in his long arms and gave her such a kiss she got all pink and pretty.

"You're always thinking of us," was all he said. We didn't notice what we were eating we all got so

excited talking about Abe's new job at the Belt Foundry. We didn't know much so we talked about all the video stories we'd seen when the heroes are space miners and engineers and rock jumpers, and we got more excited retelling all the plots and interrupting each other. Abe told a few and laughed a lot at the things we acted out. After dinner he sat in a corner polishing his pressure suit and loading it with extra fuel tanks and extra water, and listened to us still talking about asteroid mining and smelting beams and building star ships until long past sleep time.

Two sleeps later, the proximity bell rang and we woke up and saw that our orbit was going to cross a Belt Mine nugget heading for the Belt Foundry. The deeper-toned safety bell rang, meaning it had changed course with those safety jets the miners fasten to their nuggets, and it was going to miss us. While we were still sitting up blinking at the screen Abe went out the airlock like a shot, wearing his pressure suit half shut. We got to the scope window and watched his elastic rope hook onto the passing nugget while his suit was still inflating. The nugget was about a forty-meter chunk of nickel iron, good quality, by the shine of it. It went out of sight, trailing Abe. I wanted to turn the scope onto tracking and enlarging and watch Abe go for a while, but Ma said no.

"Gone is gone," she said. "Let him do his thing. Abe's grown up now. Everybody get back to bed." But when she got into bed she started sobbing.

My sister Harriet is fifteen, she's the oldest, she got down from her bunk and hugged Ma and tried to comfort her.

Ma hugged her back. "I gave you all a good Christian home," she whispered to Harriet. "And now Abe is going out into all those temptations, and those godless miners will lead him astray to the Gambling Hells and the dancing and the wicked girls."

I fell asleep thinking of the Gambling Hells and the wicked girls. I wished I was as old as Abe so I could go over there and resist temptation while the girls tried to tempt me. They'd tempt me to dance and play cards, and maybe I'd give in and play a little, just to make them feel better. Cards sounded like fun.

Next day, picking vegetables out of the aquarium, I remembered thinking like that and I felt sorry. I went to Ma and put my arm around her neck. "I won't ever leave you, Ma."

She laughed and cheered up, and set Harriet and me to repairing the spare water temperature circulation pump. Harriet and me were the oldest now, so we could do the important jobs like fixing machinery. She set my little brother to farming the aquarium instead of me. I felt

important, but fixing the pump was hard and slow, and Harriet got kind of mean and sharp-talking when we made a mistake, and tried to make it my fault.

I missed Abe.

Next week, Saturday, Abe came in the airlock and surprised us. He was wearing a new pressure suit with light blue stripes and carrying a big gift box, and gave it to Ma. It was a new pressure suit and when she got into it and inflated it it didn't change shape much from her shape. It still looked like a person, and like her. She looked at herself in the mirror and let out a squeal that sounded like one of the girl kids. "Heaven's sake. It looks like I don't have nothing on, almost."

"Looks fine, Ma," I said. "Now we'll know it's you when we're all outside working."

"It looks sinful," she said, but she said it low and timid, 'cause she wanted us to argue.

"You work hard. You deserve a pretty new suit," Abe said.

"It's real pretty, keep it, Ma," said Harriet.

"Girls are supposed to look pretty. It's only right!" I said it very loud and Harriet and me had said the right things because Ma turned and reached up and hugged around Abe's neck. "I'll keep it. Thank you, Abe, thank you."

When Ma let go of Abe he stood up straight past the center spin point without bracing his feet. We saw him tilt and all yelled for him to crouch down, but he'd forgotten about low spin centers in a week in the big barrelhouses at the Belt Foundry, and spinpush got him and he went over sideways looking surprised. We ran under him to catch him and all went down in a tangle, wrestling and laughing like we used to.

After he got all us kids piled off him and sat up Abe said, "It's real good to be home."

He went around grinning and fed the aquarium fish and when Ma served him a plate of dinner he sneaked most of it off his plate to the floor to watch the piglets whistle and push each other for it. He was grinning all the time. Around sleep time the proximity bell rang and Abe got back into his new blue striped pressure suit and kissed Ma. "Friends coming to pick me up," he said. "I'll get presents for the kids, my next paycheck. Back in two weeks."

Ma let out what she'd been worrying about all week. "Hold back against those temptations, Abe. Don't let your new friends lead you into drinking or drugs or gambling or sinful girls. Promise?"

"Nice of you to worry about me, Ma," he said and hugged Harriet and me and Bobby, and Renee, and Ruthy, and then climbed up to the centerlock and out.

But I noticed his way of answering was not naturally the way he

talked, and he *didn't* promise. He didn't promise anything.

I wondered.

Next week was busy. One of the two piglets gave out a boxful of little baby piglets, and Ma kept us from playing with them for three days, but we watched them a lot. The week after, the piglets were bigger and noticed us more and Ma let us play with them. Wednesday when we kids were in bed Ma and Harriet got together and killed the old father piglet and salted it for bacon. When we found out why he was missing we kids decided to stay mad at Ma and Harriet for a long time. But Ma explained to us that old piglets don't grow wise and don't have any good memories to remember, they just get tired and stop having fun, so they don't get any pleasure out of living a long time. She said we make space for more new young ones by eating the old ones.

We tried to stay mad at Ma and Harriet, but we had to admit the baby piglets were having fun. In another two days they were running all over the barrel, playing follow the leader in lines and squealing and rolling around like balls. We all got laughing so hard we forgot to be mad.

Ma announced that the next time we crossed the orbit of Sam's Trading Post we'd trade some piglets for some banty chickens and then we'd really see some racketying around.

Bobby and me started hopping around pretending to be chickens and making chicken noises and I climbed the climbing net and hung in the middle of the air at zero gravity flapping my arms and pretending to be a hawk.

Somebody started to work the airlock door. I was almost into the airlock tunnel right in the middle of the barrelhead wall and I could see the airlock door open and a gold-colored head dome push through. Then a stranger in a pressure suit crawled into the tunnel. She was moving different from any of us, sort of wiggly and happy, and she pulled off her globe helmet and let out a lot of bright gold hair that floated in zero G all around and over her face. She looked like a dandelion.

"Hi," she said to me through her hair. Behind her feet I could see Abe trying to push through the spin door, but her feet were in the way and it couldn't spin.

I stopped flapping and grabbed the net. "Come over and catch onto the net here, Miss," I said, feeling stunned. "Hang alongside of me and let Abe in."

She launched in the weightless air of the tunnel like a gold fish, and floated to me through the air, and grabbed and hung so close to me her gold hair was brushing against my arm right up to my shoulder. I could smell flowers.

Abe crawled through the tunnel and stuck his head out opposite us.

But there was no room on the net. The girl was staring around at a circle of faces. Everyone in the barrelhouse, including the pigs, was in a circle at the bottom of the net standing around her in all directions looking up, like spokes in a wheel.

We'd hardly seen anyone new except Sam and MacPherson whose orbit was almost the same as ours. She didn't look like them. We only passed MacPherson twice a year, and then we took a look into his barrelhouse, but we didn't stay long because it was full of flowers and bees. We'd have MacPherson over to dinner all of a week, because his orbit was almost the same as ours and took a long time to pass, and after he'd left we'd have honey enough to last until the next visit. But he was tall and wrinkled and squinty. He didn't look like this girl. She didn't look real. She looked like the girls in the stories on the video screen.

I don't know what Ma said that got us off the net. She got us all introduced to the girl and the girl introduced to us. The girl's name was Sylvia Saint Clair, and then Ma set us to running around straightening up, setting tables and making space. I cleared pump parts off Abe's bunk and put them in a box.

I began to feel something going wrong when I heard Ma say for the fifth time, "Take off your space suit and stay a while, Miss Saint Clair."

And Abe was trying to interrupt her, talking in a low fast voice. "Ma, there's something I've got to explain to you."

Then Ma had talked the girl into taking her pressure suit off, and she didn't have anything on underneath, and we were all looking.

I mean she almost didn't have anything on underneath. She was decorated with some jewelry draped around where a bathing suit would be if she was swimming. She looked like a swim queen wearing jewelry instead of a swim suit.

We kids just stared. We didn't know if it was right or wrong, what Miss Saint Clair was wearing.

Abe said, "Ma, we gotta explain. Miss Saint Clair had to leave in a hurry. She couldn't bring her

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things. She came away in her bathing suit."

Ma said, "Hush up Abe. Harriet, get the girl your bathrobe." Her voice was very clear, every word separate, and we all got scared because that meant that Ma was mad angry. She looked straight into Miss Saint Clair's eyes, not looking again at what she was dressed in. "Where you from, Miss Saint Clair?"

Abe said, "Ma, it doesn't matter where she's from. She's a good girl and we're going to get married."

It was the wrong time to say anything like that to Ma. She didn't look at him. She kept her eyes on the girl. Her voice sounded like a hammer tapping a steel spike. "Where you from, Miss Saint Clair?"

"From Georgia, Earth," the girl said and quickly got inside the bathrobe my sister Harriet held out for her. She was pale and scared of Ma. Ma is only five-foot-three, but sometimes everybody is scared of her.

"Where were you when Abe met you, girl?" Ma asked.

"Jason's Emporium." The girl squirmed and giggled nervously, but squirming and giggling was the wrong thing to do with Ma standing so straight and quiet and staring, and everybody else frozen still, so scared of Ma we were afraid to twitch.

Ma asked, "That's a Gambling Hell, isn't it?"

The girl squirmed and giggled again weakly, "Well, I wouldn't call it that." Her blond hair was hanging down limp over her face by now. I was awfully sorry for her. When Ma has you pinned to the wall, lying makes it worse, a lot worse. Suddenly she saw Ma's steady gaze on her, and she froze. Ma just looked into her eyes and waited.

The girl whispered. "Yes, it's a Gambling Hell."

"Glad to hear you talk honest," Ma said like a steel hammer. "What were you doing there, girl?"

"I was dancing," the girl whispered and seemed like she was shrinking down. She wrapped the terry-cloth robe tighter around her. "And . . . and things."

"Things, eh?" Ma asked. "What do you think of yourself, girl? Abe is a good man. I raised my boy to be a good Christian man with a good future. Do you think you're good enough for Abe?"

Miss Saint Clair shrank down so much her knees must have been bending inside the bathrobe. She looked up into Ma's face and answered very low.

Ma said loud, "What'd you say, Miss Saint Clair? My boy would like to hear you say it." And I was awful sorry for Miss Saint Clair. I wanted to get into my bunk and zip it closed over my head to get away, but I couldn't move or make a sound because I didn't want Ma

to turn and look at me with that cold look.

The girl whispered something again, with her gold hair over her face and crouched down to the floor and started crying.

Ma said, "She said *No,* Abe. She don't think she is good enough for you. She don't want to marry you."

"I'm going to marry her anyhow!" Abe roared suddenly and he was standing straight and tall past the zero spin center, looking down at us from awful high up, and he looked awful big and awful mad. "I know what's good for her. And I'm going to get her out of that Gambling Dance Hall away from those dirty fingering drunks that say dirty words to a sweet girl. It's no place for Sylvy. She needs good people around her that treat her nice. You ain't treating her nice and kind, Ma, and I'm ashamed of you."

He looked as tall as God.

Ma looked from him down to the crouched crying girl in Harriet's bathrobe and Ma's face crinkled up like she was going to cry. "I'm not treating her nice. You're right, Abe, I'm not."

She started crying and bent over the girl, patting her shoulder. "Abe, sit down honey, before you get dizzy."

Ma pulled at the girl's shoulder, trying to get her to look up. "Girl, child, you're welcome here. Don't be scared. Have a cup of hot chocolate. I just ain't used to strangers."

We pulled over some cushions and Abe sat down next to the girl and Ma sent Harriet to get some brandy and I ran to pour hot water into the chocolate powder and honey, and we all sat on cushions on the floor in a circle and passed cookies, and Ma let us each have a little cup of the hot chocolate and brandy she mixed up for Sylvy. It

The Analytical Laboratory / October 1974

PLACE	TITLE	AUTHOR	POINTS
1.	A Matter of Gravity	*Randall Garrett*	2.50
2.	Inhuman Error	*Fred Saberhagen*	2.76
3.	Truth to Tell	*Joe Haldeman*	2.96
4.	Gone With the Gods	*Andrew J. Offutt*	3.83
5.	Contact!	*David Drake*	4.11
6.	Sleeping Dogs	*Harlan Ellison*	4.49

tasted strange, but the girl pushed her hair back so we could see she was smiling and looking at each one of us, though her face was still a little red around the eyes.

A meteorite hit the side of the house with a clang, but we ignored it because we were happy. You live in the Asteroid Belt you gotta expect some gravel. Ma said, "Tell us about Georgia on Earth, Miss Sylvy."

Ma's voice sounded sort of far away and dim, like the air was thinning. I thought it was the brandy changing my ears, but I looked over to the safetypatch balloons and saw that the whole cluster of them near the airlock that usually hung limp were puffing up round and one was already floating free carrying its big flat patch. Another pebble or something hit the side of the house with a loud clang.

I jumped up and yelled loud, "We're losing air. We're losing air," and my voice sounded soft and far away because there wasn't enough air to carry it.

Everyone jumped up and grabbed a handful of feathers and a balloon. Abe passed a handful of feathers and a balloon to the three little kids. Then he began to check out the airlock and the gear storage section around the airlock tunnel for holes. I went to my section I always check out in air drill, the floor around the aquarium where the sunlight comes pouring in through the green algae and seaweed and reflecting off the silver fish. I could see the water level was still up in the aquarium so I just let a trickle of feathers out of my fingers in the whole floor circle at the foot of the aquarium, looking for a draft.

Harriet let out a hoot. She'd been checking the garden and she was pointing to a hissing big hole in the dirt between the dandelions and oats with a pile of white feathers trying to suck in. Same time, Bobby and Renee let out a double yell where they'd found a hole under the bunks. I heard the slap and clunk as they let a balloon suck through their hole and pull its sticky patch into place, and then I was helping Beatrice dig the dirt away from her hole while Ma and Abe tried to get the hole plugged with a tapered cork until the steel bottom was clean enough for a steel patch. Then we stood panting and quiet, dizzy from running with not enough air, while the emergency air tanks popped their valves and hissed air slowly back up to normal.

The piglets were lying on their sides panting, and the whole place was white with feathers, like a picture of a snowstorm on Earth. We hadn't taken a minute and Sylvy sat holding a cup of hot chocolate with white feathers all over her, looking surprised.

We didn't get another minute. There was another clang and a roar that sounded something like a big

voice shouting. Harriet and I dived on the spot that clanged and I got there first with my balloon and let the new hole pull the balloon through and pull the patch up tight.

The big voice roared again. "Saint Clair, ten minutes before . . ." was all I could make out. The rest was roar.

"It's a magnetic talk beam," Abe said. "Maybe the radio's not working. Maybe somebody out there's trying to talk to us."

"You mean somebody's out there shooting at us," Ma said. "Everybody get into pressure suits. Joey, turn on the radio."

"It's broken, Ma," I said. "I mean I took parts out of it to make another videotape player cause Harriet always wants to watch love stories."

"Put it back together and get it going. Right now. Never mind the pressure suit," Ma commanded and turned to Abe. "Abe, are the police after this girl?"

Abe and Sylvy were crouched down helping the two little kids get into their pressure suits and get their airhelmets zipped tight. Abe shook his head. "No, Ma, these are bad men. Sylvy signed a contract to work for a year for to pay back space transportation and training in being a singer and dancer. They won't let her quit. They sent these men to catch her and bring her back and make her dance with her clothes off for drunk men."

Ma stiffened up. She looked at me fiercely. "Radio going yet?"

I finished plugging a part in and it all hummed. "Yes, Ma."

"Tell them she's going to stay here. She's not going back there. Tell them we'll let them talk to her over the radio if they promise to be polite and talk to her like gentlemen."

I tuned around the dial until I hit a loud hum. I tuned into the middle of the hum and pushed the send button. Ma was angry and so I let myself talk as angry as I was. "You out there, the spaceboat shooting at our barrelhouse. My mother says you can't talk to Sylvy without you being more polite. Anyhow, we're not letting you take her away. Not if she wants to stay here." Ma nodded at me and brought over my pressure suit. She watched until I let go of *send* so they couldn't hear her on the radio then she said, "Bandit drill. Stall them, Joey. Use strategy talk. Reinforcements."

The little kids started running and yelling, "Bandits! Bandits!" because they always liked the bandit drill games. Ma had rehearsed us on bandit drill every Fourth of July, Mayday, and Veterans' Day all our lives. She said every citizen is his own police, and has a patriotic duty to fight bandits and make space safe for other citizens. She said if you didn't fight for your rights you didn't deserve any. We'd get out in space and practice war.

I could hit a moving target two miles away with a light beam two out of three and pretend it was a laser. If I had a real miner's laser the house-sized nuggets floating by would have arrived at the foundry all chopped up.

There was muttering and clangs and noise from the radio and then a voice came in loud. "Who's that? There other people in that rusty old barrel?"

I counted everybody and added one for strategy. "Five kids, and two men and Ma and Sylvia Saint Clair. And we're all her friends. And we're good shots. You can't come in here without a warrant."

Behind me Ma was saying, "Don't use the lasers. Those men probably have reflecter shields. Just launch cargo. Who's the best aim with the syrup?"

The barrelhouse spins for gravity so anything we store on the outside to sell at the trading post will fly off it it's not held on tight. "A little at a time," Ma said. "Fire whenever you're sure it won't miss." She hates to waste good syrup, that we can trade at the store. I took a look behind me and saw Harriet with her eye on the scope, watching a shiny spaceboat, and her hand on the faucet that controlled an outside pipe. Our barrelhouse turned around and the spaceboat swung out of sight and the stars turned by and then the spaceboat began to swing into sight again. Harriet turned the faucet full on and counted three, then turned it off.

Two tough voices were talking to me over the radio. "Kid, we didn't come out here to get into a fight with a bunch of kids and an old lady. We don't want to hurt you, or cut up your house. There won't be any trouble if Miss Saint Clair comes back and gets back to her job."

I put my finger on the talk button. I shouted, "What do you mean, no trouble? My brother works for Belt Foundry. We just used laserflash signal and told the manager at Belt Foundry how you just shot two holes in our house. They're coming to get you."

I looked back at Ma and she nodded. That's what she meant, strategy talk. Always claim reinforcements are coming. Nobody can see a tight-beam laser message except the person it's aimed at. The men in the spaceboat couldn't be sure I was lying. Belt Foundry men are tough and their boats have cutting lasers that can carve a ship into little pieces.

Sylvia was trying to get to the radio. I pushed her back. "Don't you talk to them, Sylvy. They already talked you into a contract. Don't let them talk to you."

"You don't understand." She was zipping up her pressure suit. "You people could all get killed. Those goons are bad people. I can get out there and give up to them before they start to shoot!"

The men in the spaceboat

shouted over the radio. "You just gave us a reason to act tough. We don't have time to be nice! Get into your space suits, we're going to open that barrel up like a slice of cake, and take her."

Abe reached out a long arm and pulled Sylvy away from me and the radio. "Stall him some more, Joey. Negotiate." Ma nodded.

I pushed the send button. "My ma says she'll negotiate with you for better work for Miss Saint Clair. She should sign a contract for doing something else she likes better."

The radio sputtered and burbled. "Our terms. Damn, something . . . burble . . . We were sent to bring the gurble back, not negotiate no curble, gurble." It turned to a frying noise.

I figure the syrup had gotten to them and was sticking up their radio antenna surfaces. Abe let out a big last dose of syrup as we spun around again, and we could see the spaceboat wasn't shiny any more. It was covered with streaks of sticky-looking foam. The syrup was foaming in space, and drying out to something like crunch molasses candy, on the boat, all over its view lenses. There isn't much in the world that will dissolve hard molasses.

After a while of us watching, the boat started going slowly around

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and around like a pinwheel, so the molasses was into something else.

Abe took a special laser rig we had in a back locker, and recorded a *help* message on it with our orbit coordinates and the story about the men from the gambling place, Jason's Emporium, and what they'd done to our house. He set it up outside the airlock to track the signal radio flashes from the Belt Foundry and flash back.

About an hour later two very big, tough tractor tugs armed with front-end cutters and handlers arrived and hovered on our view screens like giant lobsters. They talked with Abe. I mean the engineers in them talked with Abe while we kids danced around and begged for a ride inside a tug. Then the tugs sliced off all the gun barrels that were sticking out of the spaceboat and one tug towed the spaceboat off toward Jason's Emporium and the other engineer stayed and said he'd take Abe and Sylvy off toward the Belt Foundry to get married.

The engineer explained to Abe that the Foundry would loan him money to buy Sylvy's contract from the gambling hall. They said that other men had had to buy their wives' contracts. The company had gotten used to giving out loans for a man to get a wife. Besides, they needed girls over at the Foundry to do office and thinking type work and brighten the place up. Sylvy could get a job there. They said everybody at the Belt Foundry agreed they needed to have more women around.

She and Abe went off together and left the place kind of empty, but after a while the piglets started chasing each other around faster than ever and we started laughing and the place seemed crowded enough after all.

Ma lets me visit Abe and my new sister Sylvy almost every weekend. The Belt Foundry living barrel is so big it has three floor levels, each with a different gravity and a gymnasium with zero G to fly in at the center. Abe won't let me look into the men's lounge because he promised Ma, but I look in sometimes while I'm waiting for him and Sylvy to come down from their room, and I see men playing cards, and Ping-Pong and pool, and drinking and laughing and watching a huge screen video and telly. And every time a commercial comes on it's either advertising Sam's Spacesuits or Jason's Emporium, Turkish Bath, Massage and Fun Palace. When it advertises Jason's Emporium where Sylvy came from, it always shows pictures of lots of girls dancing, wearing nothing but jewelry and long beautiful hair like Sylvy when I first saw her.

When Abe and Sylvy came down Abe looked very happy but he pulled me away from the door to the lounge. He said he promised Ma. Ma won't even let Harriet

come visit at all. She has to stay home, even though she's fifteen and I'm only eleven. I guess there's some advantage in being a man.

When I grow up and get a job at Belt Foundry, I'll go to Jason's Emporium, like Abe did, and rescue a girl.

I'm studying hard to be an Engineer. ■

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1. Location of known office of Publication is 350 Madison Avenue, New York, New York 10017.

2. Location of the Headquarters or General Business Offices of the Publishers is 350 Madison Avenue, New York, New York, 10017.

3. The names and addresses of the publisher, editor, and managing editor are: Publisher, None; Editor, Ben Bova, 350 Madison Avenue, New York, N.Y. 10017. Managing Editor, None.

4. The owner is: The Condé Nast Publications Inc., 350 Madison Avenue, New York, New York, 10017. Stockholder: Through intermediate corporations to Advance Publications, Inc., S. I. Newhouse, sole voting stockholder.

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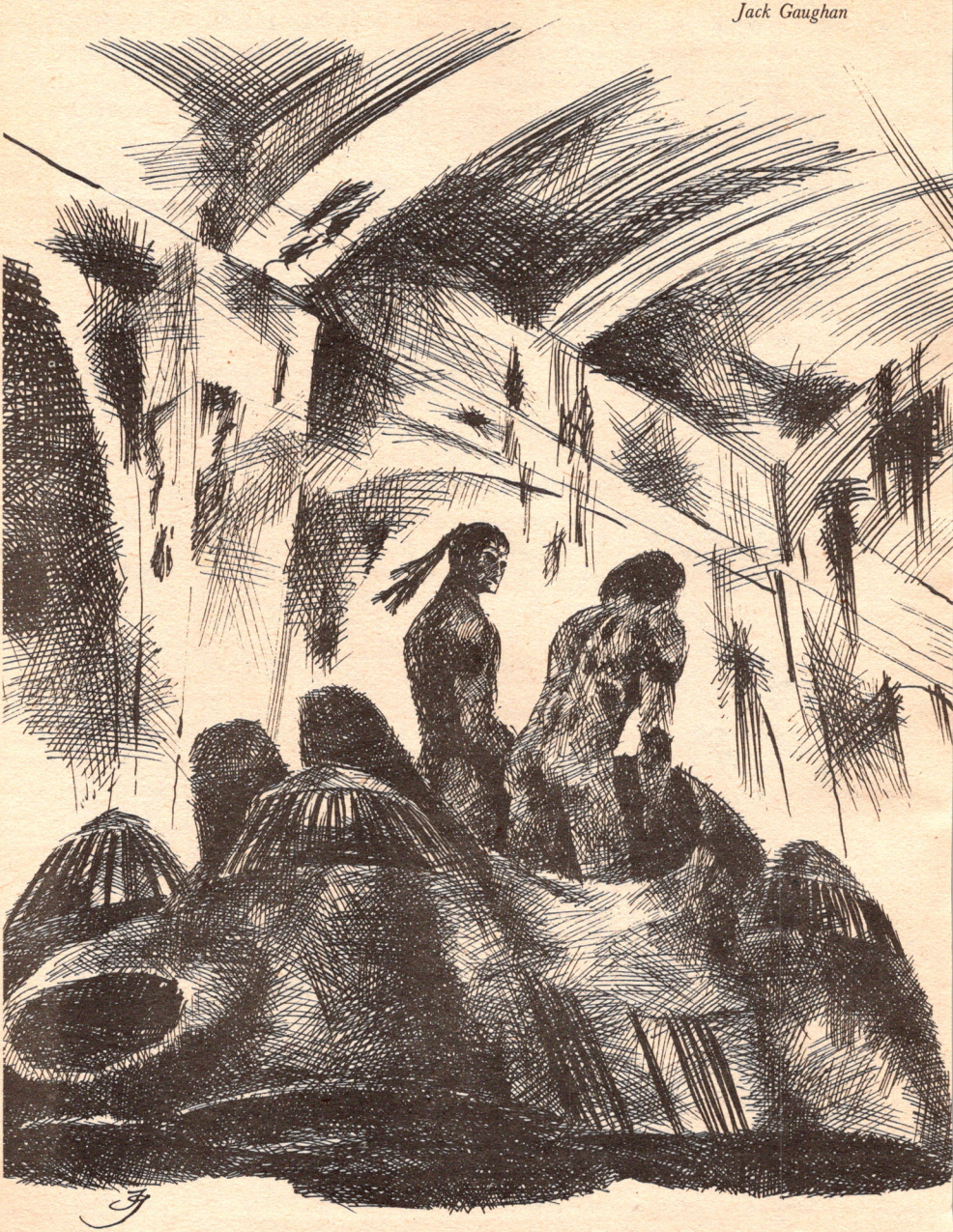
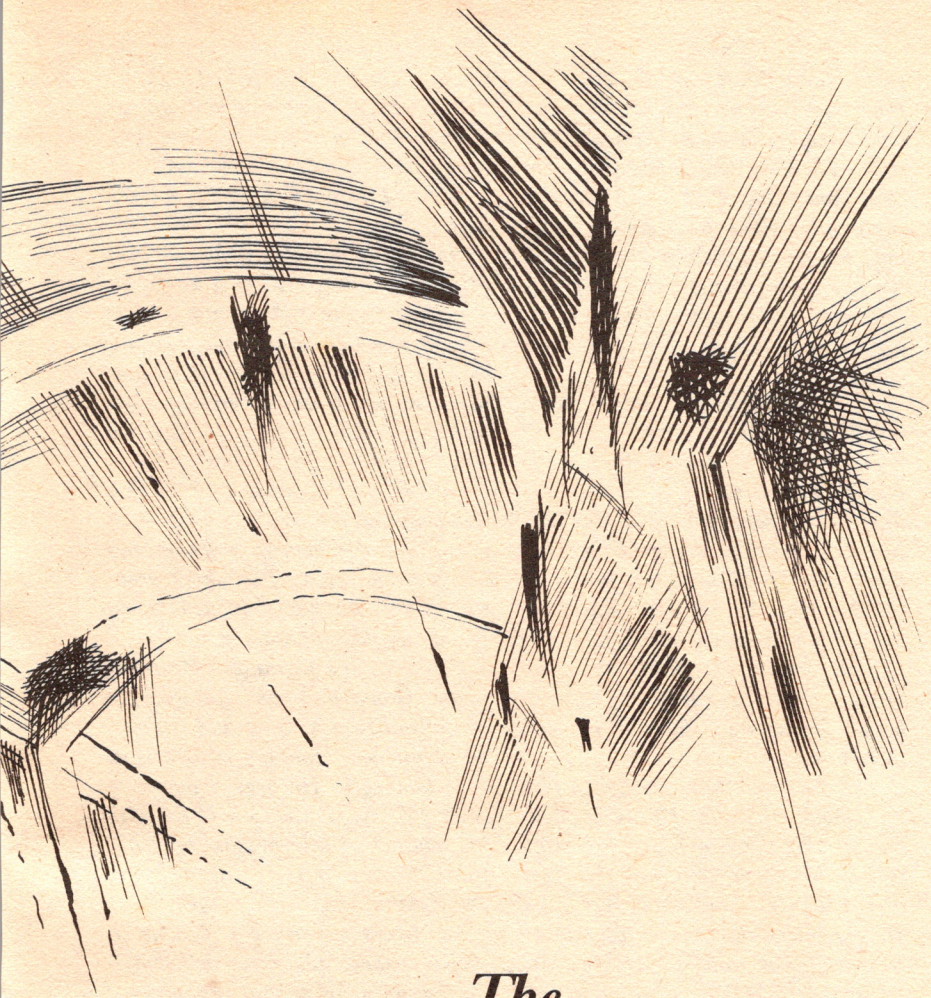




The Indian Giver

It's tough enough to destroy a world-controlling computer that's gone mad. But when it's linked to an immortal, how do you kill it? Without killing the immortal?

Alfred Bester

Synopsis

In the Solar System of two centuries from now, violence and death, drugs and bugging, are an accepted lifestyle. There is one small Group of semi-immortals who are Molecular Men, impervious to ordinary death but mortal to massive injury and susceptible to a frightful Group disease they call Lepcer, or the big L, a freak mutation of leprosy and cancer.

The newest member, Dr. Sequoya Guess, has been recruited by Edward Curzon, nicknamed Guig by the Group. Sequoya is a Cherokee Indian, a brilliant physicist, who has just completed a cryogenic experiment at the United Conglomerate space center. Three astronauts have been flown in space, frozen into suspended animation. When they are brought back to Earth they are no longer grown men, they are reduced to embryos.

The discovery throws Sequoya into an epileptic shock. He is brought out of it by the Group, using a risky technique which kills him for four minutes. Dr. Guess recovers, and Guig realizes that the extraordinary treatment has transformed him into an immortal Moleman. So many unexpected experiences are too much for Sequoya, who takes refuge in the family home in the Erie Indian reservation. Guig trails him and soothes him with a description of the advantages and dangers of their partial immortality.

They become friendly, drawn together by their membership in the Group, Guig's adopted daughter, Fee-5, who is Sequoya's assistant at the space center, and by Sequoya's lovely sister, Natoma, to whom Guig is married through a lucky misunderstanding.

Natoma is introduced to members of the Group in Guig's home in Mexifornia. Fee-5 flies into a jealous fury which is strange because she has already fallen deeply in love with Sequoya Guess. There are more oddities. Sequoya begins to listen to what others can't hear. Poulos Poulos, nicknamed The Greek Syndicate by the Group, arrives with news that the embryo phenomenon has been observed by another corporation, but he has protected Guess by buying the corporation.

Poulos is the wealthiest Moleman in the Group and can afford it. He can afford to give Guig and Natoma an enormous plantation in Brazil as a wedding gift. He begs Sequoya to come to I. G. Farben on Ceres with his capsule and cryonauts and continue the embryo research there. Poulos also owns I. G. Farben.

Dr. Guess has asked U-Con to finance further embryo research but is turned down for several reasons; the most important the fact that he has become strangely hostile and tactless. When he inspects the cryonaut embryos, which prove to be developing hermaphrodites, he is forced to resist an attempt by U-Con to take over the cryocapsule. He suffers another epileptic seizure and is taken pris-

oner by U-Con along with Guig, Poulos and Fee-5.

While they are locked up in an isolation bubble, Fee tells Guig what has changed Sequoya. During the four minutes of his temporary death the giant Extrocomputer which he used in his work moved in on him and established a parasitic relationship with his brain cells. The two of them are now one, and through Sequoya the Extro is able to communicate with and command the entire network of electronic machines around the world.

The captives are aided by Group specialists who free them and plan to break the seal U-Con has put on the chamber containing the capsule. Their unexpected advent leads Poulos to the conclusion that the Extro is not the only Group enemy; there is also an unknown Group renegade who has declared war on them and is even more dangerous.

When Sequoya and Fee-5 are put in possession of the cryocapsule again, they proceed to launch it to get it to a safe place away from U-Con. There is a frightful accident and Fee-5 is killed. Guig is shattered by her death for which he feels responsible, so when a message arrives that the Greek and Sequoya are en route to Ceres, he and Natoma are relieved to follow. They learn that the message was false. No one at I. G. Farben knows where Poulos, Sequoya and the capsule are.

Dismayed by the dangerous confusion of events, Guig takes Natoma to the gift plantation in Brazil for a delayed honeymoon. Here they are visited by another member of the Group, nicknamed Boris Godunov, who persuades Guig to return to the USA (United Spangland of America) and help in the search for Sequoya through whom it is hoped to combat the deadly electronic network.

They return, are met by one of the cleverest members of the Group, Hillel, the Jew, who plans a sophisticated three-pronged search. While Guig is hunting down the Cherokee he is being hunted himself. The Extro-controlled network conspires to harass him, bankrupt him, prosecute him for crimes, destroy his home and possessions; all culminating in the explosive destruction of a linear transport which smashes Guig into oblivion.

Part Three

11.

No one knew what his real name was and nobody asked. It was a killable offense to ask that kind of question in the Underbelly. He was called Capo Rip. No one knew his origins. There were a dozen stories but he was such a liar that none could be believed: orphanage (there hadn't been an orphanage in a hundred years), street gangs, adopted by the Mafia International, synthesized in a laboratory, product of the artificial insemination of a gorilla. He was cold-blooded, indif-

ferent to women, men, companionship, friendship. Icy and hard. He was a percentage player with such a keen memory for numbers and probabilities that he was barred from all gambling tables; he was a losing proposition for the house.

But percentage prevented him from killing. Not that he gave a damn about murder but he didn't like the odds against. He never took a chance when the odds were against. "Bod once wrote that all life was six-to-five against," Rip said. "I don't try anything unless it's six-to-five for." Yes, Capo Rip could read, and he didn't play even-money bets. He always looked for the edge.

That made him the ideal cannon and the idol of the Bellyworld. He was strictly business; robbery, burglary, extortion, blackmail, bribery. He won tremendous respect. Best of all, the Belly learned that he was dependable; he never slashed, he paid all contract cuts promptly and never welched on an obligation. Bad percentage. He knew that loyalty could only be bought.

He lived quietly in small hotels, drop-ins, lodges, gambling houses—provided he kept away from the tables. He was never armed but had shown himself to be a cold crusher when cornered into a gut-fight. He always preferred the coward's cop-out from one-on-one trouble—no percentage in that—but some goons on a machismo trip wouldn't let it alone. Then he crunched. The Belly believed he could be light-heavy champion in all-out if he wanted to.

Capo Rip won so much respect that a small coterie gathered around him, uninvited. They were unknown bods without records and therefore of no account, but they seemed to be serviceable. One was a woman, also uninvited and unwanted but she remained loyal and laughed off outside propositions. No odds in them for her. Mercenary.

Rip's capers were ingenious. A few examples: The Exchange Brokerage House protected itself with a quicksand moat. The drawbridge was raised after hours and no one could pogo onto the pointed roof. Capo Rip froze a path across the quicksand with dry ice and skipped quietly over the skulls of long-gone failures for the heist. He bribed a secretary at the Foreclosure Trust to type on her terminal keyboard in Morse clicks giving him crucial security information. He ripped the vaults.

A governor's fifty-year-old wife began to turn youthful; hair glossy, skin transparent and lovely. Rip checked the governor's staff. A ravishing young secretary. He checked the rejuvenation salons. The wife had no accounts. "Arsenous poisoning," he said, and the governor paid, and paid and paid. Posing as a pianolo tuner he came to the home of a celebrated but cautious collector, casing for a rare

Russian gem, a seven-inch goddess carved out of the largest emerald in history by Fabergé three centuries ago. Nowhere in sight. He returned with a compass and located her in a steel casket plastered up in a wall. He sold seven replicas molded out of synthetics to demented collectors and then had the *chutzpa* to return the original gem to its original owner. The Belly loved that.

Between the heavies he worked the petty buncos: medical frauds, radium pitchers, glass caskets, the honeymoon and obituary racks, the cataracts swindle, building lots in Atlantis. *Atlantis,* for God's sake! Begging cassettes, fading tape contracts. Oh, he was versatile and busy, busy, busy. His energy was unbelievable. The Underbelly estimated that his vigorish must come close to a million a month.

His capers were quiet. Capo Rip did not care for publicity, and that was one of the constraints he required of his coterie which they respected. For unknowns they were remarkable; as silent as knives, never speaking. The Belly could not persuade them to talk, drink, gas, trip, gamble, communicate. They were dead-face deadly, so no one cared to get acquainted through a gut-session.

The Underbelly could not believe it when Capo Rip and his Merry Men disappeared. He had started on a job and then there was none. They thought he'd been busted (improbable) but when discreet questions were asked of his professional fixer, who was in possession of a generous retainer, he reported that Capo had not been in touch with him. Capo Rip had gone up like a skyrocket, exploded in a blaze of glory, and then vanished.

He was belted down in a berth that rocked. The belts were locked, he found out soon enough, but there was a dark stranger hatefully smiling at him constantly, always calling him, "Great Capo." The woman was there, too, feeding him meals with a runcible spoon. Rip still didn't know her name and didn't want to, now more than ever. He took some pleasure from spitting the food into her face.

Whatever the place was, it swarmed with nurses and doctors in agitated conversation using words like *Platysma Myoides, Abdominal Aponeurosis, Rectus Femori* and *Ligamentum Cruciatum Cruris.* Bewildering. The only one who made sense was a young surgeon who was a lycanthrope. He kept turning into a fanged wolfman and devouring the shrieking nurses alive, usually starting with the *Gluteus Maximus.* The dark man and the woman paid no attention to them.

"This a hospital?" Capo Rip growled.

"No, Great Capo. You're watching a kiddie show, 'Young Doctor Prevert.' I'm sorry. We can't block the broadcasts." And he took the

captive to the head and guarded him with a burner.

"You bastard. I hate you."

"But of course, Great Capo. Lunch now."

Back to the rocking berth and the woman came to feed him.

"You bastard's bitch. You sold me out."

"Yes, Capo, but you don't know why, yet."

"Where am I? What am I doing here?"

"On a schooner in the middle of Lake Mitchigan," the dark stranger said. "What are you doing? Preparing to pay a price."

"How much?"

"First for what. No?"

"To hell with that. Name the price, you damned bastardly barber. I'll pay it, and I promise you you'll never barber anyone in the Belly again."

"I believe you, Great Capo." He started to leave and then turned. "The price is telling me where I can find a man named Edward Curzon."

"Who?"

"Edward Curzon."

"Never heard of him."

"Oh come now, Great Capo. With your connections and experience you must have come across him. And with your ingenuity and expertise you can find him for me. I'll contract for the hit and make it worth your while."

"I never hit. Bad percentage."

"I'm aware of that, which is why you're here under gentle persuasion. You must find and hit Curzon, Great Capo."

"Why me? I can put you onto twenty killers."

"To be sure, but none with your integrity. An essential part of the contract must be that it can never be traced to me. I can trust no jimp except you. Find and hit Edward Curzon, Great Capo."

"How did you snatch me on the Chalice job?"

"I set it up. I also have ingenuity. Now be reconciled. You must find and hit Edward Curzon."

"Suppose I agree. I can always sell you out, the way that bitch sold me."

"No. Your word is your bond. That's why you're here. Think about Curzon, Great Capo. When you're ready to agree, we'll talk. Surely you must have run across the name during your brilliant career. The name or something like it. Search your mind, Great Capo. Think hard."

Curzon? Or something like it? Curzon, Curzon, or something like it? The Capo thought hard. How many did he know in the Belly? There was Cur, the Lion. Not worth hitting. A cheap jimpster who only worked a cold house. Larry, the Lace Curtain. A society goniff who reported the comings and goings of the heeled for a rotten two percent. A shrof named Chan Kersey who sold his chop to the counterfeit crowd. Curmin the

Vermin who ran a decoy swindle outside the legit gambling houses. Yellow Kid Curze who operated a Big Store in an abandoned bank bldg. Now he sounded likely, but the Kid was gentle and harmless.

The woman came in, balancing a plate of food and that goddam runcible spoon. There was a hard gale and she had to balance herself against the lurch of the goddam schooner, clutching at whatever was handy. Nevertheless she was thrown and the plate went up out of her hand. She was quick on her feet and poised when it came down, still right-side-up. She caught it and smiled at Capo Rip and even winked.

"*Krijeeze*!" I yelled. "The Sevres!"

She stared at me. I stared at her. "Wait a M," I said. "You're not my Nat. You can't be. I saw her die this morning. Who are you?"

She threw herself on me and began to cry and shriek like the wolfman was fanging her. Words finally came out of the screams, "Hilly! Hilly! Quick! He's found Edward Curzon."

The Jew rushed down into the cabin, clutching at anything. He stepped on the plate and crunched it. "Hi, Guig," he said. "My foot is full of beans."

"What the hell is going on? Half hour ago I saw Natoma die in Charleston. Now here she is with me on this thing that rocks and—"

"Schooner," Hilly said. "All sail; no machines. We're on Lake Mitchigan."

"And here you are and God knows who else and what else. Natoma, I love you as always forever, but give me a little breathing space. I have to ask questions. Hilly, there's no Lake Mitchigan. It's gone the way of Erie."

"Not quite yet. There's a hundred-mile puddle left, and here we are in the middle where we can't be monitored."

"How the hell did you get me here so fast, Hilly?"

"Yes, it was fast," the Jew conceded. "It only took three months."

"Three—!"

"You see, Mrs. Curzon? I warned you it would be total amnesia."

"Do you mean to tell me—that I—get off me, Nat. I've got to get up."

They unlock and I up, not feeling v. flippant. "You'd better tell me the whole story," I said grimly.

"It couldn't be simpler, Guig. The linear explosion and what you thought was your wife's death knocked you into a massive epileptic seizure."

"I came out of it?"

"Not into sanity; into epileptic delerium. Complete loss of memory. Complete loss of moral control. Complete loss of humanity."

"*Dio*! And then?"

"You became Capo Rip."

"Who?"

"The most vicious jimpster in the

Underbelly. There's no point in trying to restore your memory of that. I wouldn't if I could. Best forgotten forever."

"In other words, I turned into another vicious Sequoya."

"Don't say that, Glig."

"I do say it. He tried to kill me. He nearly killed you. What saved you?"

"You took too long, so I got off the linear to join you just before lift. The explosion knocked me unconscious. By the time they found me in the wreckage you were gone."

"And then?"

"I recruited four feisty braves from the reservation and we found you in the Belly. Then I met Hilly in GM and told him everything I knew. He set this up."

I gave Natoma a hard look. "I'm sorry. I'm going to hit our brother."

"Please, Glig, no. Don't be Capo Rip any more."

"I have to hit our brother."

"The Group won't stand for one of us killing another."

"No? If Guess'd blown me up, plenty of them would have cheered."

"And if you kill Guess?"

"More cheers. And what do you intend to do with the renegade? Send him to a shrink? Protective custody? Therapeutic recycling?"

"But Guig, you gave Sequoya perpetual life."

"Yes, by killing him once. Now I'm going to take back the gift by killing him again. I'm an Indian Giver." I aimed a finger at Natoma. "And I don't care if it destroys my marriage."

Natoma turned to the Hebe in despair. "Hilly. Help."

"I can't, love. He's generated the purpose I talked about on the Heath, and now he's too much for us to control. Don't you see it? *Gottenu*! I never thought he would turn so savage. He scares me."

"What did you shoot me with to bring me out of this?" I asked.

"You're behind the times. We don't shoot any more; we use estrogens."

"What was it?"

"Let's get something kosher," Hillel said in level tones. "You're feeling your new muscle now, but don't try to use it on me. It's none of your business what I used to bring you out of the delerium. The whole event has got to be forgotten. I can't control you, but by God you can't control me. Either we confer as equals or get the hell out of here. You can swim to shore."

He was right. I gave him a courtesy bow. "Gung. Have you located the Chief?"

"Y. With your help."

"Mine? Imposs. I never got near him. Where is he?"

"About a quarter of a mile below us."

"What! In the lake?"

"Under the lake."

"Expound."

"The network tried to keep you out of Tchicago, and me out of GM. What connection could there be between the two? That gave me the third possibility I was hoping for. GM used to be a city named Detroit. There are hundreds and hundreds of miles of exhausted salt mines under Detroit, leading all the way to Tchicago. I was prowling one end and you were threatening to get to the other. Dr. Guess and his creatures are somewhere in the middle. Possibly just us."

"How could he get the capsule into mine shafts?"

"They're not shafts; they have the dimensions of boulevards."

"Why the demand for salt?"

"They used an extraction process. Sodium for energy."

"Ah! And the Chief is probably tapping the original power lines for his damned capsule."

"Possibly."

"As equal to equal, Hilly, first things first. Y?"

"Y."

"We have got to pinpoint Guess. I want a look at him and his freaks."

"Agreed."

"The hit comes later. Shut up, Nat. Any job needs careful casing."

"Now you sound like Capo Rip."

"Whether I remember him or not, a part of him must still be with me."

"I can see that."

"Do we work together or from opposite ends?"

"I would say opposites. I'll run decoy."

"Gung. I'll need help. Who would you suggest? Someone from the Group?"

"N. One of your wife's braves."

"Are they available?"

"They're aboard. The trouble is, they speak none of our languages."

"I'll come and interpret," Natoma offered. Damn brave.

"No," the Jew said firmly. "You're dead and you'll stay that way on this schooner."

"It's all R," I said. "She taught me to talk Sign while I was teaching her XX. I'll be able to communicate. Who's the best tracker?"

"Long Lance," Natoma said, "but he's not as good a hatchet as Arrow Edge."

"I told you there would be no killing yet. This is just an exploratory. Now shut up, Nat, and do what Hilly says. Stay dead. We'll discuss our brother when I get back, and there's plenty to discuss. Who was so angry she wanted him roasted over a slow fire?"

"But I—"

"Not now. Does the network think I'm dead, too, Hilly?"

"Presumably. You disappeared after the blow-up."

"What about this Capo bod?"

"I've often wondered, Guig, whether your brilliance-potential lies in the conscious or the unconscious. Now I know. When your subterranean took control it couldn't have picked a better cover.

Of course the network is aware of Capo Rip. It's aware of everything. But it would be impossible for the Extro to link that cold-blooded jimpster with gentle, kindly Curzon."

"Not gentle any more."

"Perhaps. We shall see."

Suddenly I went weak and had to sit down. My face probably turned green because Hilly smiled and asked, "Seasick?"

"Worse. The worst. I just thought of a possible result of the explosion that slammed me into the delerium."

"Ah. The big L. I'm afraid you'll have to sweat it out, Guig. Remember, it isn't inevitable."

"I don't understand what you're saying," Natoma broke in. "What is big L? Why is Guig so upset?"

"He'll explain to you another time, Mrs. Curzon. Just now he needs distraction and I happen to have a fascinating bijou handy." He opened a locker and took out the oddball dagger I'd found in the ruins of the house. "Any particular reason for carrying this in your boot when you were Capo Rip?"

"I don't know now. Why?"

"I know your original motive. Mrs. Curzon told me. Do you know its value?"

"No."

"In the thousands. It's an extremely rare antique, many centuries old."

"What is it?"

"A Katar. An ancient Hindu dagger."

"Hindu!"

"Yes. Once again you've been invaluable. You've identified the renegade. He dropped the dagger when he was destroying your house."

"The Rajah? No."

"The Rajah. He's the only Hindu member of the Group."

"It's out of the question. There must be another explanation. A jimp lost it."

"A jimp carrying a dagger you only find in museums? The Rajah dropped it."

"It was stolen from a museum."

"Try the grip. The only Spangland hand this Katar could fit would be a child's. The Hindu aristocracy have always been v. small-boned. The Rajah is the renegade."

"That beautiful, exquisite prince? Why? Why? Why?"

"It will give me great pleasure to ask him in person . . . if I survive to hear the answer. Now shouldn't we start the Rajah-chase?"

"R. Nat, bring me Long Lance. I want us both war-painted when we start tracking. That'll throw them a curve."

"*Gottenu*! You don't intend to stalk Guess on foot through hundreds of miles of caverns?"

"What would you suggest?"

"The same thing I'll use. Hovercraft."

"They're machines. They can report."

"To the Extro? Not from a quarter-mile under rock."

"Then to Guess."

"How? He needs the Extro as his switchboard, just as the Extro needs him. Apart, they're nothing."

"R as usual, Hilly. Hovercraft it is, with supplies. Did you find any cash on me when you snapped the snatch?"

"Not much. Twenty thousand or so. We'll never know where you stashed Capo's ill-gotten gains."

"I know," Natoma said.

"How much, Nat?"

"Enough to ransom Sequoya."

"Y. I can see we're going to have one hell of a discussion. However. Twenty will do nicely. Gung. Get Long Lance, Nat. So it's me from Tchi and you from GM, Hilly. We'll meet somewhere in the middle, and for *Gottenu's* sake, don't shoot. Remember, the only good Indian is a live Indian."

The Hebe smiled. "Now you sound like the old Guig again. I like him better than Capo Rip."

"I don't. Gentle and kindly? S. Let's move it."

"Extro. Alert."

"Alert."

"Where is Hillel?"

"Where are you?"

"You know damned well. The capsule blabbed all the way to GM."

"But it cut off. How?"

"We're a thousand feet under solid rock where you can't reach me. Where is Hillel?"

"In GM."

"W?"

"N known."

"The network must deflect him. He's dangerous."

"N possible when my switchboard is cut off."

"You function in nanoseconds. Issue instructions now, while I'm available."

"Issued. He is to be destroyed like Curzon."

"N, N, N! I did not want Curzon destroyed, only deflected. The same holds for Hillel. Do not ever dare exceed orders again."

"N? What can you do? I am invulnerable."

"And arrogant. When I have time I'll find the chink in your armor. Alert the network that I'm holding you all accountable."

"It is alerted. It is listening to us. You must know."

"And is your new aide listening?"

"I have told you. He cannot hear me. I can only hear him."

"Through me?"

"You are the switchboard."

"His identity?"

"Still unknown."

"When it is known he will be held accountable, too. Out."

"Not yet. Q: What is adabag?"

"Ah."

"Q: What is gaebac?"

"So."

"Q: What is cefcad?"

"Where did you get that?"

"From you, Dr. Guess."

"H?"

"The words run through your mind constantly. What is adabag, gaebac and cefcad? This may be urgent for us."

"Let the network answer."

"It has already reported N knowledge in any lingua. You must have heard."

"Y. Out."

"Stop. When you cut off from me we are all deaf and mute. This cannot continue."

"It will not as soon as I've finished my work. It will explode. Out."

Long Lance and I were brilliant. The lurid warpaint made us inconspicuous in Tchicago. We didn't buy a hovercraft; Long Lance stole one, a turtle two-seater. The first thing we did was smash and gut the communications panel. We were now handling a mute bird. We located the down-shaft to the salt mine under the wreckage of the Lyric Opera House and a square block of rubbish piled higher than the original bldg. where I once saw a performance of *La Boheme* by Darryl F. Puccini.

We stocked staples and had to burn our way down through a quarter of a mile of trash to get to the mine proper. They'd been using the shaft as a dump for a century. It was almost like an archaeological dig: cans, plastics, glass, bones, skulls, rotted cloth, antique kitchen utensils, a cast-iron radiator, a gear box and even a hunk of a brass saxophone. B-flat. I grabbed at and missed a rare Nixon nickel.

Long Lance goggled at the remains and I liked him for that. I

liked him anyway. He was long, lean, assured and coiled like a steel spring. Outside of Algonquin and Sign he spoke exactly three words: *si, no,* and *Capo.* That was plenty. He must have made one hell of an accomplice for the late, great Capo Rip.

It was hot as blazes down in the mine and I was glad we were naked. I had a gyrocompass and we headed toward GM, Long Lance doing the handling. I'd taken it for granted that we'd need lights and stocked up on lamplands. Not so. The rock salt remnants in the boulevards were luminescent—radioactive probably—and emitted a green glow that gave us all the light we needed. Probably more roentgens than we needed, too. I did worry and wondered whether there was an estrogen which could treat radiation exposure. The big L was still on my mind.

It was a scene out of the Inferno; this great, glowing boulevard with a vaulted ceiling dripping green light, jagged corridors leading off left and right, and we had to explore every one until the hover couldn't squeeze through. I figured that if the turtle couldn't make it, the capsule couldn't. That saved a little time. We ate and slept once. We ate and slept twice. We ate and slept thrice. Long Lance gave me a look and I returned it, but we went on through the silence and the glow.

I thought about the Rajah, still not believing the Hebe and the evidence of the Katar. How could I? The Rajah had been and still was the supreme ruler and supreme deity of a small mountain state named Mahabharata, now shortened to Bharat. It had a few lush valleys for farming, but the Rajah's Gross National Product came from rich mineral resources. Every time technology or luxury invented a need for new metals, there it was in Bharat. Example: When platinum was first unearthed in the Ural mountains it was later discovered that the women of Bharat had been wearing beads of rough platinum nuggets for generations.

The Rajah, when I first met him in the Grossbad Spa, was singularly exquisite: sooty black—unlike M'bantu who is shiny—handsome aquiline features, great dark eyes, delicate bones. His voice was slightly sing-song and lilted with humor. He was always beautifully dressed and beautifully mannered. He was not and still isn't democratic. Caste.

I was told that when he first visited western Europe, back in the days of Napoleon, his conduct was appalling. As a supreme prince and god he could do no wrong in Bharat. On the continent it was something else. For example, whenever the necessity arose he would relieve himself in public. No floor or potted plant was safe. He soon learned to behave himself and I sometimes wonder what hero had the temerity

to teach him. Possibly Napoleon. More likely, his sister Pauline Bonaparte who entertained the Rajah as one of her lovers.

And this man of supreme power and wealth, with everything that anyone could possibly want, to turn renegade and attack the Group? Why? In his eyes we were beneath him. Everybody was. Caste. Did he want to become prince and god of the entire world? Nonsense! You only find that motivation in cheap fiction. I never believe anything that doesn't make sense to me, and this didn't make sense.

On the fourth day Long Lance stopped the hovercraft and made emphatic Sign to me. I emphatic. He listened hard for a few minutes. Then he got out, pulled a dirk from his belt and worked it into the rocky floor. He knelt down, fastened his teeth on the handle and listened through his mouth. Then he came back to me, took the compass and examined it closely. He showed it to me.

By God, the needle had swung two degrees from the north toward the west and hung there no matter how we jiggled it. Long Lance grunted, retrieved his dirk, climbed back aboard and began crawling the turtle. The first broad corridor on our left he turned, went up a hundred yards, stopped, repeated the dirk bit, and came back to me. He made a globe gesture and said, "Si, Capo."

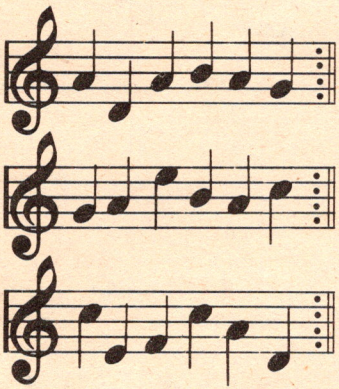
Like a damned fool I opened my mouth to ask questions which he certainly couldn't have understood. He said, "No, Capo," and signed me to listen. I listen. I listen. I listen. Nothing. I look at Long Lance. He nodded. He was hearing what I couldn't hear. What a tracker! I listen. I listen. I listen. And then I heard it. Music.

12.

We pulled the hover back to the main boulevard, and turned toward Tchi until we located a side corridor big enough to accommodate the turtle. We backed in deep enough for cover, got out and went north again on foot. Long Lance had the dirk in his belt. I shoved a meatburner into mine, just in case. No sense taking chances. He was barefoot, feet like iron; I'd sprayed my soles with a half-inch of plastic. He was naked, painted, and the green luminescence gave him the appearance of hideous tooled leather. If I looked anything like him we must have made a charming couple.

Suddenly Long Lance gripped my shoulder, stopped me and turned me around. He pointed to a smallish side corridor we had just passed and made See-Sign. When I asked him what, he made Animal-Sign. What kind of animal? The answer was complicated but I finally twigged. He was telling me he'd seen a lion. Preposterous, but I had to show him respect. We went back to the corridor and

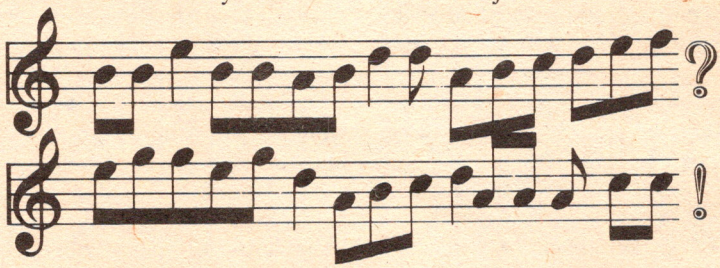
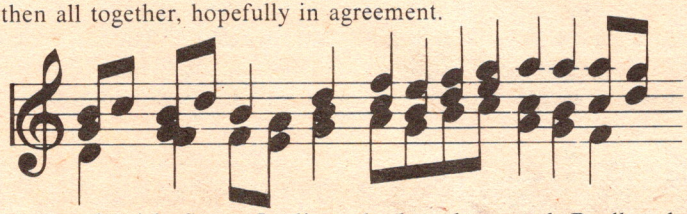
looked in. No lion. We went in. A dark maze. No lion. Not even a snarl. Long Lance was unhappy and confused and wanted to make a thorough inspection. We had more urgent business on hand. I urged him out and we proceeded.

When we reached Capsule Street he took the lead, naturally, signing me to imitate everything he did. I imitate. It was a crash course in the art of sneak attack. As we progressed I became aware of a white glow up ahead, then a low drone, and then the music again—a sort of hum of voices. It went like this:

Not my idea of any tunes ever written by Peter Ilich Korruptsky (b.1940, d.1993, greatly regretted). As we went smooch-foot toward the glow, the Rue de la Capsule enlarged, and when we crept up to the source of the light and the drone, I gawked. It was an enormous chamber, lined with the old sodium extraction apparatus, and in the center was the capsule, patched into giant old energy cables and droning away. The Chief had picked the perfect stash. Then we saw his three humming babies.

They were enormous; nearly seven feet high. They were dead white albino. They were built like men but there was something uncanny about their joint articulations; they moved like insects. Then I saw they were blind. They emitted their tunes as a sort of radar or sonar. Then I looked at their genitals. Hillel had guessed wrong; not putz and twibby both. They were white rosebuds, very large, the size of my fist, and the buds kept unfurling into leaf and closing into bud again spasmodically.

Suddenly I had a flash of memory. Once in Africa with M'bantu, the Zulu was showing me the ecosights. He kicked over a rough clay cone and I saw thousands of terrified termites scrambling for cover. They were white, they were blind, and McBee told me that they communicated by uttering sounds which the human ear couldn't hear. Sequoya's babies were seven-foot termites, but they could be heard.

I made Sign to Long Lance that I was going in alone. He didn't like the idea but you can't argue in Sign, you only make statements. So I went while he stayed. The three things sensed me almost immediately and came at me. I pulled the

burner out of my belt, but they intended no harm; they were simply overcome with curiosity and delight. While I looked for Sequoya they explored my body with their hands and jabbered in music:

And then all together, hopefully in agreement.

I answered with Scott Joplin, Gershwin, Korruptsky, Hokubonzai; all the great standards I could remember and hum. They loved the vintage ragtime which I think they thought were funny stories, and kept asking for more. I obliged and they kept falling on each other and me, convulsed with laughter. Very nice termites, you know. Almost lovable once you got over xenophobia, and a damned good house for a stand-up comic. But still no Sequoya. I went and looked into the droning capsule with my three fans crowding around me. *Niemand zu hause.* I yelled, "Guess! Chief! Sequoya!" No answer. The shout scared the three things and they backed away. I reassured them with a few bars of "Melancholy Baby" and they came back to be petted. Really adorable. But human?

A low hiss came from Long Lance and when I looked he beckoned urgently. I disengaged myself from my fans and ran to him; no time for autographs. He made Listen Sign. I listen and listen. Then I heard it; the murmur of an approaching hovercraft. "It's Hilly from the other end," I thought. I took Long Lance by the shoulder and we both ran down to the Avenida Las Salt Mine. The Algonquin didn't like it but I gave him no time for statements. However, he did pull out his dirk. That was statement enough.

Just as well. It wasn't Hilly, it was the Chief in a hover stacked with supplies. Long Lance melted against a wall and disappeared;

probably reluctant to mess around with the son and heir of the most powerful sachem in Erie. Not so the son and heir of the great Capo Rip. I stepped out in full view, blocking the hover, one hand on the burner which was idiotic but I was damned angry. Guess stopped and stared in amazement, not expecting visitors and not recognizing me.

"H," I said in XX.

"W? W?"

"You look prosperous, brother."

"It isn't Guig."

"Y."

"It can't be."

"It is. Decorated. Not for valor."

"Guig! But—"

"Y. You missed, you son of a bitch."

"But—"

"You almost got Natoma instead."

"N."

"Y."

"But I—"

"I know. I know. Tried to get her off. I got off instead because her Spang is n. so good. She sends her love. So does the sachem and mama."

"And you?"

"Only trying to figure out how to kill you."

"Guig!"

"Y. It's going to be a hit."

"Why want to kill me?"

"Why kill me?"

"You were on the attack. It was self-defense."

"And Fee? Was she on the attack?"

He was silent, shaking his head.

"You know she was mad for you. She would have done anything for you."

"That damned Extro," he muttered.

"Now where have I heard that before? It wasn't me; it was the other guy what done it."

"You don't understand, Guig."

"Make me understand."

"You've changed. Tough and hard."

"I said make me understand."

"I've changed too. I've lost my pride. So much has happened to me. It's a challenge, I know, and I think I'm failing to meet it. So many variables and unknowns."

"Yes and yes. You've been in the habit of linear thinking in a straight line. Now you have to think in bunches."

"That's most perceptive, Guig."

"You may have lost your pride, but you haven't lost your arrogance. The son of the great sachem."

"I'd rather call it ambition. And why not? When I was a kid my idols were Galileo, Newton, Einstein, all the great discoverers. And now I've discovered something. Can you blame me for fighting for it, tooth and nail? Have you seen my cryonauts?"

"I've seen you and the Extro network. Is that your discovery?"

"It's part of the bunch, as you

put it. You must have seen my cryos. I know you, brother."

"Cut the schmaltz. Y, I've seen them."

"And?"

"You want me to be frank?"

"Y."

"They're beautiful. They're fascinating. They capture instant affection. They inspire instant horror."

"You have no idea of their potential. They think and communicate on the alpha wavelength. That's why they can't talk. They're brilliant. In a few months they've reached the university level. They're incredibly gentle—not an ounce of hostility. And they have a remarkable quality I've never heard of before—I don't think the concept has ever existed—they have electronic valence. You know how people respond to weather. They respond to the upper levels of the electromagnetic spectrum, above the visual level. Run a current through a wire and they're elated or depressed, depending on watts and amperes. Guig, they're wonderful. Why horror?"

"Because they belong on another planet."

"We are all on another planet; everyone, everywhere."

"Well said. You're astromorphic."

"Then?"

"Sequoya Edward, we're the Group. We owe loyalty and love to each other. Y?"

"Y."

"Sequoya Edward, we're of humanity. We owe loyalty and love to every man. Y?"

"Edward Sequoya, what about your kills?"

"Ah."

"How many?"

"I've lost count."

"This is loyalty and love?"

"To the Group, yes. I want everyone to become us, no matter what the price."

"And I have loyalty and love for my three cryos. I want everyone to become them."

"By killing off humanity? I'm biomorphic."

"It's that damned Extro," he growled.

"Why can't you dump it?"

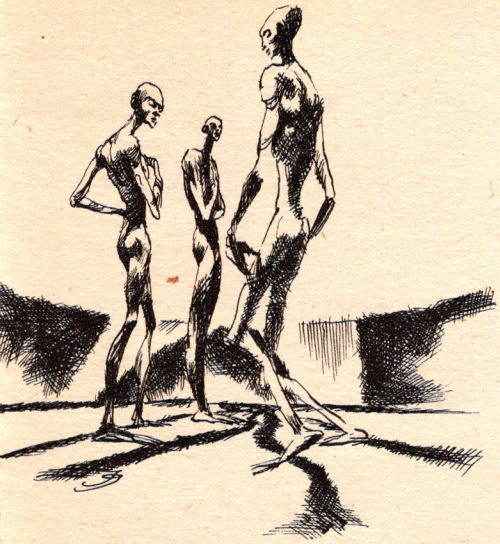
"Guig, you know about multiple personality?"

"Y."

"I'm suffering from multi-multiple personality. I've got the entire electronic network in my head. That's why I'm hiding down here. It's another remarkable phenomenon which must be investigated, but not until I've finished with my cryos. I have time."

"So the Extro is running you."

"Y. N."



"You're running it."

"Y. N."

"Make up your mind."

"Which mind? I have thousands."

"Brother, I love you."

"I love you, brother."

"And I'm going to kill you."

"Cain and Abel?"

"Go and catch a falling star."

"Get with child a mandrake root."

"Tell me where all past years are."

"Or who cleft the Devil's foot."

"If thou be'st born to strange sights."

"You've skipped, Guig."

"I know. Go on. Let's get to the point."

"Things invisible to see."

"Ride ten thousand days and nights."

"Till Age snow white hairs on thee."

"Then, when thou return'st, wilt tell me."

"All strange wonders that befell thee."

"The point, Chief. Strange wonders have befallen thee, brother. I envy you. I want to be part of it. I'm sure the entire Group will. But you start a killing war. W? Are you still fighting the ancient Indian Wars?"

"No. No. No. That's gone with the past years. Is there a war? Yes. Yes. Yes. Now listen carefully, Guig. Ten thousand years ago we lived within our environment. We took only what we needed. We returned what we couldn't use. We were all one organism. We did not destroy the balance. Now what? We've destroyed, destroyed, destroyed. Where is the fossil fuel? All gone. The fish and animals? All gone. The woods and jungles? Gone. The soil? Gone. Everything? Gone.

"You're quoting verse, are you? Do you know this? *'You have brought down the firmament and yet no heaven is more near. You shape huge deeds without event, and half-made men believe and fear.'* By God, Guig, we are all half-made men, a failed species, believing and fearing and destroying, and I'll re-

place us. You said I was astromorphic. D'you think I want the plague of man to pollute the stars? We poison the cosmos at her roots."

"When you say replace you mean kill."

"No, we'll merely crowd the failed breed out with the new. The killing is the Extro. It's monstrous."

"And you can't dump it?"

"How? It's moved in on me forever."

"You don't want to anyway."

"No I don't. It's too valuable a tool to throw away. The trouble is, I can't control it yet."

"Y. It's like a battle of giants, but you're outnumbered, brother, two-to-one."

"How do you mean?"

"There's another giant joined up with the Extro and you're being used by them, you damned dizzard switchboard. You'll never control them."

"Maybe you'd better kill me, brother," he said wearily.

Now what answer could an angry man make to that? Thank God, at the moment a hover whispered up from the GM end, stopped, and the Hebe eased out. (Hilly doesn't hop.) He came up to us and said, "So we've got you surrounded. Dr. Guess, I presume. I'm Hillel, the Jew, and were there ever any British Guiana one-cents or was it all a paper-chase? V clumsy. My dear Guess, you must learn to consult the Group when you want to swing a swindle. You can't depend on a computer."

Either Hilly's unexpected appearance or his aplomb left the redskin speechless.

"Supplies, I see," Hilly chatted. "Suppose you take them to wherever it is and Guig and I will help you off-load. I must have a look at your cryonauts."

The Chief got back into his hover, still wordless, and turned up Capsulestrasse. Hillel and I followed. Long Lance came out of the stonework and hissed. I shook my head and he melted again. Hilly nodded in approval. Nothing escapes him. He surveyed the extraction chamber with one sweep, and X-rayed the cryonauts with another. "They only speak music," I murmured. Hilly nodded and gave them "Hatikvah" while he helped the Chief unload. They loved it. The Chief was silent, probably trying to cope with the unexpected by thinking in bunches. I was silent, too, because I was still in a fury with Sequoya-F.

At one point Hilly whispered to me, "Look at this, Guig," and opened a small box. It contained a dozen steel sewing needles.

"So he's going to make clothes for them," I said.

"Not my point. Watch."

He put the box on the flagged floor. It swung around by itself and aimed at the power cables. Hilly turned it back, let go, and it swung around again.

"That answers the question," he said.

"What question?"

"The question you haven't asked yourself yet."

He saw I wasn't interested, dropped it and turned to the Chief. "May we speak words without upsetting your most remarkable creatures?" he asked pleasantly.

"It depends on the music of your voice," Sequoya answered. "Apparently yours pleases them."

"Yes. A racial legacy. So does yours, apparently. So we can talk."

"About what?"

"An appeal. You and your cryonauts are about to make history. You will be remembered forever. Don't hide down here. Come out into the open and let us help and protect you. You know you can depend on us."

"No. This mission belongs to me."

"To be sure. And no one will be permitted to cut into any piece of your credit. It's all yours."

"No. I don't need help."

"And now another appeal. Your astonishing symbiosis with the Extro and the electronic network. That must be researched. It's a giant forward step in evolution. Won't you let us help you?"

"No."

"Dr. Guess, you're making history and yet you seem to be aborting yourself. Why? According to Guig's reports you're no longer what you were. Why? Aren't you in control?"

"N."

"Are you governed by the Extro?"

"N."

"Do you govern it?"

"N."

"It's like a bad marriage. Does it know you're hiding down here?"

"N. It can't reach me down here."

"Doesn't your hover tattle when you're up there?"

"A machine's memory is only as long as the sophistication of its electronics. The hover has awareness of the moment, no more."

"Existentialist. But the Extro remembers."

"Y."

"Is it alive?"

"Tell me what life is and I can answer."

"I can answer, Dr. Guess. It's alive through you. Tell me why you're hiding from your partner down here."

"Because I'm confused, damn you!" he shouted. The cryos recoiled. "Too much has happened to me and I'm trying to sort it out. I'm having difficulties with my cryos; they keep spooking and I don't know why. There's too much I don't know. For God's sake, leave me alone!"

"I understand and wilco, but in return you must leave us alone."

"I told Guig, I have nothing to do with the killings."

"Then you must stop giving life to the killers."

"How?"

"Leave this planet. Go beyond transmission."

"Never."

"Ah. You're intransigent. It's the recent elevation. Intoxicating. Guig was like that after Krakatoa, imperious and sulky. It will pass. It must. When it does, come to the Group. Ready, Guig?"

He turned and I followed him out. The cryos chased after us, humming for more ragtime, but they stopped short at the entrance to the chamber. "That's the question you didn't ask," Hillel said. "It's also the probable cause of their spooking. You're one rotten inductor, Guig."

"I'm one rotten everything," I said.

"That's a foolish put-down. Don't you know the Group envies you?"

"For what?"

"Something we've all lost."

"What?"

"Passion. When you lose that you lose humanity. Where's Long Lance?"

I hissed and Long Lance appeared.

"I want him to stay, watch and report," Hilly said.

I made Sign. "Stay. Watch. Report."

He made Sign. "Report where?"

"Big canoe."

He nodded and melted. We got into Hilly's hover and took off.

"Two things," I said. "No, three. I must have it out with Nat. I want a conference with the Group. You know where they're scattered. Collect them."

"And the third?"

"There can't be a hit. This brilliant son of a bitch has got to be saved."

Hilly smiled. "Then there's nothing to have out with Mrs. Curzon." He began to hum "Hatikvah."

13.

"I scraped up all I could on short notice," Hillel said. "We're meeting in Retchvic. We can't be eavesdropped in Iceland."

"D'you think the Extro network tailed you to them?"

"Only an outside chance. I used cash only; no ID. Your cash, by the way."

"Mine?"

"Capo Rip's. Mrs. Curzon handed it over to me."

"How much?"

"About two million and a half. I have the balance waiting for you."

"Who'd you get from the Group?"

"M'bantu, Tosca, Domino, Ampersand, Queenie, Herb Wells and No-Name."

"Oh God! Not that nothing."

"Then you, of course, myself and our host, Erik The Red."

Y. Erik owns most of Greenland and Iceland. He has geyser-power and probably owns half the hot

springs in this heat-hungry world.

"No Poulos?"

"The Greek's not coming."

"More important business?"

"No."

"You couldn't get in touch with him?"

"No."

'That's not like you, Hilly."

"No one will ever get in touch with him again."

"What!"

"He's dead."

"What? No. Not Poulos . . ."

"A Malay creese through the heart."

I was speechless. At last I stammered, "I—no. Not the Syndicate. No. It couldn't happen. He's too brilliant—careful—aware . . ."

"Not enough for the Rajah."

"Where did it . . .?"

"Calcutta. Last week."

"Give me a moment, Hilly . . ."

"All the time you need."

When I came below from the deck I washed my mouth and face. I was in control again. "You said a Malay creese. How do you know?"

"Left in his heart."

"But Malay?"

"A hired assassin. These goons bind up their putz until they're in agony and then carry out the holy mission. The local *politzei* say it was planned like a Commando raid; with support, flankers and back-ups. God knows how many first-class goons the Rajah has on his payroll. The Greek must have been closing in on him, and he didn't stand a chance."

"If the Rajah can hit the Greek . . ."

"We're all as good as dead. How do you feel now? I know because it took me the same way in Calcutta. Have you got the strength to give me your news?"

"I can try," I said heavily.

"Good man. Go ahead *Gescheft* is *Gescheft.* Business is business, and it's our only salvation."

"You were R, as usual. There was nothing to have out with Nat. She's all for stopping our brother and saving him. She just didn't want to go the hit route. I'll bring her along to Retchvic." It was painful, talking.

"Good. And?"

"Long Lance came back to the big canoe day before yesterday. Nothing to report. Sequoya is still down there educating his babies."

"Even better. We can go on using transport safely while he's separated from the Extro. The trouble is, we don't know when he'll come up again, so we'll have to move fast. Where are the braves?" Hilly was v. brisk. It helped.

"Nat sent them back to Erie."

"Gung. Let's move it to Iceland."

"What about this big canoe?"

"*Gottenu*! Who cares? We'll leave it. Maybe it'll start another Sargasso Sea in Lake Mitch. We're for Retchvic."

Erik's pleasance in Iceland was a giant, steaming greenhouse fes-

tooned with exotic tropical plants. The guests from the Group were all there when we arrived and all in character; but as I've said, we're all characters and always in character. A few touches: A drab little woman you wouldn't look at twice was Tosca, the compelling actress who has been sweeping the media for generations with her electrifying performances. The flamboyant diva in eye-catching costume was Queenie in drag. We have never been able to persuade him to undergo a transex transformation. He says he prefers remaining a faggot. Erik isn't red and isn't even a Scandy. He looks like a jolly Karl Marx.

There were greetings, of course, and the gallant M'bantu put Natoma on his arm and escorted her around, introducing her. He was particularly proud of the tremendous progress she'd made with her XX. I began to wonder whether I should shift my apprehensions from the Greek to the Zulu. Certainly both of them outclassed me, but when you get right down to it every member of the Group outclassed me with the exception of the nothing No-Name who now seemed on the verge of falling into a Pitcher Plant.

"This is Guig's meeting," Hilly said casually, "but I'd better brief you first. You'll all recall that when I contacted you I handed you a slip of paper asking you to come to Erik's immediately on an urgent matter. It warned you not to speak and to use cash transport without ID so that you couldn't be traced. I didn't use ear-beads or cassettes for a most interesting reason. The whole planet is enmeshed in the damnedest electronic bugging network conceivable, the result of Guig's recruitment of our newest and most splendid Group member. He'll be our pride, but presently he's created a crisis which you know about, more or less. Here's the complete scene." Hilly gave it to them, fast and acute. Then he turned the meeting over to me. I got to my feet and here is the conference, names withheld on the grounds of Group privilege.

"First, I must reinforce what the Jew has told you. The renegade is a savage, dangerous enemy. The murder of Poulos demonstrates that, and no one knows who will be next if we don't stop him."

"You don't call him the Rajah?"

"No. I'm not as sure as Hilly because the Rajah doesn't make sense to me as a vendettist. Why? There's no reason I can think of. I hold that it might be anyone, including myself. Trust no one. Be on your guard."

"D'you think it might be Guess?"

"Not likely. He's merely the human switchboard that makes all this possible. The problem: How do you kill the switchboard? Shut up, Nat. You don't know where I'm headed."

"Poison is out. Just an hors d'oeuvre."

"So is gas."

"It's got to be an external killing."

"A stab through the heart, like Poulos."

"Or a burn."

"Blow him up, like the attempt on Guig."

"Simple beheading."

"Ugh!"

"Yes, we know. You nearly accompanied Danton in the tumbril."

"Whatever happened to Dr. Guillotin, by the way?"

"Died in bed, not regretted."

"If you want a neat, tasteful death, shoot Guess into space."

"How would that kill him?"

"Radiation exposure. Vacuum malnutrition. Or he might explode from internal air pressure."

"Be realistic. How can you shoot a naked man into space? Tie him to the nose of a rocket vehicle?"

"Then put him in a capsule and shoot him into the sun. That would ionize the package into a fizz."

"And how would we put him together again?"

"What?"

"That's the point. We can't lose him."

"So why talk about killing him?"

"To bring us face to face with the problem. How do we kill the switchboard without killing Guess? That's where I was headed, Nat."

"I apologize, Guig."

"It *is* a puzzle."

"Almost a paradox. How do you kill a man without killing him?"

"What about a time-shoot back six months so I can abort this damned crisis before it started?"

"It won't work."

"Why not, Herb?"

"You'll be a ghost."

"There ain't no such thing."

"I've tried it. I can't shoot a man into his own lifetime. The cosmos won't tolerate two identicals. One of them has to be a phantasma."

"Which?"

"The second."

"So possession is nine points of space-time, and we're back where we started. How do we kill the switchboard catalyst without harming Guess?"

"You're not on target, Guig."

"N? W?"

"It isn't a question of killing the switchboard. Kill the computer."

"S! P! C! So obvious that it never occurred to me."

"You're too close to it. That's why you needed us."

"I'll loft some demurrers. The Guess-Extro symbiosis is unique. It should be explored."

"Too dangerous to delay. The situation is critical. *Gottenu*! I can feel the hot breath of the Rajah breathing down my neck."

"If the symbiosis is destroyed, a similar one may never occur again."

"The sacrifice must be made if we're to survive."

"If the Extro is killed have we

any guarantee that that will stop the renegade?"

"It will. Not altogether, but to a great extent."

"How do you figure that?"

"He didn't start his war until *after* the Guess-Extro connection was established. When that's destroyed he'll be crippled; still deadly but manageable."

"The Group has always hated killing."

"No hatred for killing the renegade. He's a mad dog."

"Y. I only wish I knew why; it might make the problem easier to solve. Now let's tackle the next question: How do I get at the Extro?"

"You're taking this on yourself?"

"I must. I'm driven. How do I kill the Extro?"

"Fire. Explosion. Metal-burn. Power cut. Et cetera."

"Without its knowledge that an attack is being mounted?"

"Are you sure that it will know?"

"That monstrous Demon Squatter with its ragtag network knows everything we do, every move we make."

"Only provided Guess is in contact to make the circuitry possible."

"Have we any guarantee he'll remain buried in the salt mines?"

"N. We might try kidnapping Guess."

"How, without the knowledge of the Extro? The moment we haul him up to the surface that damned, infernal, monstrous network will be activated, and you know goddam well that a goddam Moleman can't be drugged."

"You're driving too hard, Guig, Let's cool it."

"I can't. When I think of Fee-5 and Poulos, the Shortie killings, the—no, I'll cool it. Back to *gescheft*. Calmly. The Extro knows everything we do and maybe everything we think. What can I use to outflank it?"

"Hic-Haec-Hoc," No-Name said.

My jaw dropped. This? From Mr. Nothing? Outclassed even by him.

"He can't think. He can't speak. He's a blank."

"But he obeys signs. Thank you, No-Name. Thank you all. If Sam Pepys can be located and can tell me where to locate Hic, I'll bring him and we'll try."

But I tried the time-shot first, anyway, and H.G. Wells was right; I was a ghost, invisible and inaudible. Worse, I was like a two-dimensional phone projection. I oozed. I oozed through bods and buildings and I felt damned sorry for ghosts. Herb and I had pinpointed my spot very carefully and I was shot to JPL and oozed my way to the astrochem lab just as the crowd of afflicted stockholders was hacking and coughing its way out right through me. Uncanny.

When I oozed in, Edison was barking with laughter. "That damn fool girl brought you fuming Nitric acid. Fuming. And the fumes have

turned this room into one big Nitric acid bath. Everything's being eaten away."

"Did you see her do it? Did you see the label? Why didn't you stop her?" The Chief sounded furious.

"No. No, and no. I've deduced it. Not an Emergent, just a Resultant."

"Dear God! Dear God! I've ruined the whole pitch to the U-Con crowd."

Suddenly me did the take and let out a yell. I didn't like his looks but I suppose nobody likes his own looks.

"What's the matter, Guig?" the Group called. "Are you hurt?"

"No, you damn fools, and that's why I'm hollering. I'm Grand Guignol triumphant. Don't you understand? Why didn't he know it was fuming Nitric acid? Why didn't he choke on the fumes? Why isn't he eaten away now? Why wasn't he forced to run out with Fee and the rest? Think about it while I revel."

After a long moment, the Syndicate said, "I never believed in you, Guig. I apologize. It was a billion to one against, so I hope you'll pardon me."

"You're pardoned. You're all pardoned. We've got another Molecular Man. We've got a brand new beautiful Moleman. Still there, Uncas?"

"I can't understand a word you're saying."

"Take a deep breath of Nitric. Belt down a stiff shot. Do anything you like to celebrate. Welcome to the Group."

And as we all left the astrochem and joined the hacking stockholders outside, he disappeared, but this time the pseudo-me followed him as he slipped out through a side iris and loped down a ramp, the ghost following and hollering. What I said was shouted, hollered, poked, *"Chief it's me, Guig, listen! Hear me! Danger ahead. Hear?"*

He didn't hear me, see me or feel me; just went about his poker-face escape. It was one of the most frustrating and exasperating experiences of my life, and I was relieved when Herbie Wells' mantis snatched me back. Herb saw my expression and shrugged helplessly.

"I told you it was a lemon," he said.

So Natoma and I waited on stand-by for the out-jet to Saturn VI, otherwise known as the moon, Titan. Stand-by because it was strictly a bribe transaction. We submitted to the search for flammable materials without complaint. Titan has a methane atmosphere, poisonous and explosive. Methane is also known as Marsh Gas or CH_4, produced by the decomposition of organic matter.

People who don't travel think all satellites are alike; rocky, sandy, volcanic. Titan is a mass of frozen organic material and cosmologists are still arguing about that. Was the sun hotter? Was Titan an inner planet (it's bigger than Terra's

moon) snatched by Jupiter and delivered to Saturn without charge? Was it seeded by cosmonauts from deep space ages ago who then abandoned our Solar System in disgust?

Natoma came along, not because I needed her for Hic-Haec-Hoc but because you don't shoot Saturn in a week, it's more like a month and there's a limit. The stand-by wasn't too boring. We were entertained by the broadcast of Ice-O-Rama, a penguin sitcom. Zitzcom has just discovered that his daughter, Ritzcom, has accepted an invitation from Witzcom to spend the night with him on an iceberg. There are hilarious complications. The antarctic night lasts three months, and Zitzcom doesn't know that it was Ritzcom's twin sister, Titzcom, who accepted the invitation in a snit because her beau, Fitzcom, didn't invite her to the penguin slide-in. Oh, bbls. of laughs.

I'd warned Nat that Titan was a mining moon (they quarry the organic layer and ship it out in frozen blocks) but she didn't really understand until we'd boarded the freighter and located our private cabin for two. That was the bribe. No passengers; no crew; just deck officers and no doubt a couple of them had been willing to doss anywhere for a substantial cut. The freighter stank. The compost it shipped in-jet left a permanent aroma of the grave.

I'd been smart enough to be prepared; a huge wicker hamper with enough deli for months, clean linen and blankets. A freighter to Saturn is no luxury jet, and although there's a captain there's no such thing as a captain's table, a steward, formal meals. It's all catch-as-catch-can, with the staff helping itself to the frozen food and drink stocks whenever so inclined. You merely endure and survive at the minimum, which is another reason why Titan will always remain a mining moon.

We stayed in our tiny cabin a lot, talking, talking, talking. So much to catch up on. Natoma grieved with me over Poulos and tried to cheer me up. She wanted to know all about CNA-Drone. I told her all I could about cloning, which wasn't much, but then the technique isn't much, still in its infancy. Then she insisted on knowing why I had deep depressions, and what big L was. I had to tell her all about Lepcer.

"You must never, never, NEVER run another physical risk," she said severely.

"Not even for your sake?"

"Most of all NEVER for my sake. There will be no big L this time. I know it because I have second sight . . . all the Guess women do . . . but if you ever run a risk again I'll have you roasted over a slow fire. You'll wish you had the big L then."

"Yes'm," I said meekly. "That

explosion wasn't my fault, you know."

She pronounced a Cherokee word that would probably have shocked our brother.

Nat had been boning up, practicing reading XX. "Titan is the largest of Saturn's satellites," she reported. "It is 759,000 miles distant from Saturn. Its sidereal period is—I don't know what that is."

"How long it takes to go around."

"Is fifteen dot nine four five days. The inclination of its orbit to the ring plane—I looked those words up—is twenty apostrophe. Its—"

"No, darling. That's the astronomer's symbol for minutes. They measure space in degrees, minutes and seconds. A degree is a little zero. A minute is an apostrophe, and a second is a quotation mark."

"Thank you. Its diameter is 3,550 miles, and it was discovered by—by—I don't know how to pronounce this name. It's not in the dictionary."

"Let me see. Oh. Not many people do. Huyghens. Hi-genz. He was a very great Dutch scientist a long time ago. Thank you, love. Now I know all about Titan."

She wanted to ask questions but I promised to take her to what used to be Holland and show her all the sights that still remained, including Hi-genz' birthplace, if it still existed. Saturn was quite a sight itself as it came looming up. Nat had already charmed her way onto the flight deck and would spend hours staring at the cold, belted, spotted disc and the widening rings inclined ten little-zero.

Alas, only the two inner rings remain. Despite violent protests by ecologists and cosmologists, the Better Building Conglomerate had been permitted to harvest the third outer ring for some kind of better building aggregate. There was a housing crisis and BBC paid enormous taxes. One infuriated astronomer had been euthanised for burning the chairman of the board.

If you think the inspection was tough when we embarked you should have seen what we went through when we arrived. As we came down the long tunnel to Mine City we were searched over and over again for combustibles, quasi-combustibles, ferrous metals, anything that could produce a spark or a flame. Titan lived on a perpetual brink of disaster. One spark outside and the methane atmosphere could turn the moon into a nova.

The city was freaky. This is what happened: The prospectors quarried out the frozen marsh compost to a depth of fifty feet. When it extended for a square mile, the crater was roofed over with plastic by ORGASM (The Organic Systems and Manure Company, Ltd.). Narrow streets were blocked out in a rectilinear pattern, houses were built and there was your mining

town on your explosive mining moon. It was dark; the sun was no more than a brilliant arc light, but it did receive a lovely thermal glow from Mama Saturn. It was damp to eliminate any chances of electrostatic sparks. It stank of compost and methane and the compost-choppers.

No hotel, of course, but a residence for visiting clients with clout. I bluffed our way in. "I am Edward Curzon of I. G. Farben, and I cannot understand why you did not receive my message from Ceres. Kindly contact Directeur Poulos Poulos to verify." I also tipped in a lordly manner and did what it had taken me years to learn; behaved quietly as though I took it for granted that my orders would be obeyed. They obey.

I found Hic easily enough on the fourth day. I had a nerve-fire finder and all I had to do was move out beyond the quarrymen in each quarter—checking production techniques, you understand—and take a con. On Day Four the finder pointed and I followed it, hopping and galloping, for about ten miles until I came to a compost hut, rather like the sod houses the primitive pioneers used to build for themselves in Nineteenth Century America. It was glittering with crusted crystals of ammonia, as was all Titan. There were spectacular meteorite cracks and craters in the ice cover, and volcanic magma boiled up ("boiled" in the relative sense; Titan's mean temperature is minus one hundred and thirty little-zero Celsius) forming pools of liquid methane. Saturn was rising dramatically behind the hovel, and Hic-Haec-Hoc was crouched inside like a predator about to spring on his prey.

Now I know the popular impression. Say "Neanderthal" to anyone and an instant image of a caveman carrying a club and dragging a lady by the hair pops into their mind. Well, the Neanderthalers couldn't do much carrying or dragging; their thumbs were badly opposed. They were incapable of speech because of the inadequate musculature of mouth and throat. Anthropologists are still arguing about whether it was speech and the thumb that produced Homo sapiens. Certainly Homo neanderthalensis had the equivalent cranial capacity; it just never developed. If you can read XX look up Homo neanderthalensis and you'll have some idea of what Hic looked like: a punch-drunk, all-out, prize-fighting loser. But strong. And like most animals, he lived a life of constant terror.

I'd removed my helmet but I don't know whether he recognized or remembered me. As No-Name said, he can't think; but he understood my grunts and signs. I'd been far-sighted enough to fill a pocket with sweets and every time he opened his mouth I popped one in, which delighted him. That's how

the Russians used to reward their trained bears.

It was one hell of a session. I could give you the signs in diagram but you wouldn't understand them. I could give you the grunts in phonetic symbols but they would be meaningless to you. But Hic understood. It's true that he can't think, but only in the sense of memory and rational sequence. He can absorb and understand one idea at a time. How long it remains with him depends on how soon it's dispossessed by survival terror. The sweets helped.

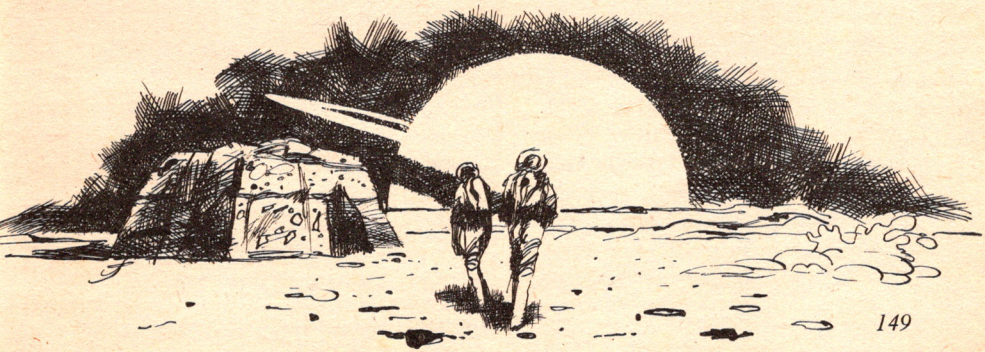
After I'd signed, grunted, bullied and sweeted him into obedience it was hell getting Hic into the extra thermal I'd packed out, but he couldn't come in out of the methane naked. Questions would be asked. I got him sacked at last and back we schlepped to Mine City, Colossus of Compost, Mother of Methane, Daughter of Destruction, with the two-ringed Saturn behind us. Damn Sequoya, he was right and that was hell. How can you fight a bod you agree with?

After a careful inspection Natoma said, "He must be shaved from top to bottom. We'll take him back as your feeble-minded brother." She looked at me perplexedly. "Guig, how the devil did he ever get out here?"

"Stowaway, probably. A Moleman can endure months of that cold, and he ate anything that was handy."

Between signs and sweets we managed to bathe and shave Hic-Haec-Hoc. Natoma decorated him with graffiti which made him look like an average. Hic liked Nat and was comfortable with her. I think maybe he never had a mother. On the other hand he also loved his bath. I'm sure he never had one before.

He slept on the floor of our cabin during the freighter in-jet. Only one trouble; he didn't like any of our hamper food and the compost stench made him hungry. I couldn't get any for him—all sealed in the freight hull—and he started eating the damnedest things: our linen, fire extinguishers,



luggage, books, playing cards. We had to keep a constant watch (he ate my watch, by the way) or he might have started on the freighter hull.

He'd become accustomed to Titan's methane atmosphere and didn't like the air in the jet. Natoma took care of that by spraying insecticide up his nose. Altogether, a problem child, and he was so clumsy-strong that you had to be cautious with him. But Natoma handled him beautifully. I think her experiences with the Erie warriors probably gave her the know-how.

As we started our approach to Earth Natoma gave a thank-you luncheon party for the deck officers. She used the last of our provisions and even heated some of them up, a tremendous luxury. How did she do it on a jet where there were no ignition tools? She made a bow-drill and sawed away until she got an ember going. Shredded plastic for tinder. Chunks of plastic for fuel. And then a fire in an aluminum basin. No fool she. The officers were enchanted, and so appreciative that two of them proposed and all of them made plans to smuggle us out of the space-port with no passport problems for my idiot "brother" who'd lost his on Titan. (And no warning to the Extro network which, of course, they knew nothing about.) We would be home-free.

And when we put down we discovered that we'd acquired a hitchhiker.

14.

At my age you learn to accept the unknowable with grace. You may ask, What, then, is the difference between the Rajah and the hitchhiker from space? Patent. The Rajah was the answer to a fact, an explanation which I could not yet accept because an integral part was missing. The hitchhiker made its appearance from an unknowable spacewhere. Neither explanations nor motivations were involved. It was a fact which could not be denied nor fitted into the cosmic construct. That fact had to be accepted as a *ding an sich,* a thing in itself.

Impossible to name its original habitat. Uranus, Neptune or Pluto, which had not yet been visited, much less explored for indigenous fauna and flora? The asteroid belt? Perhaps a refugee from the halo of millions of comets shuttling in from space, around the sun and out again? It might even be a reject from some contra-universe, spat into our system through a minuscule White Hole.

Metabolism? N known. My hunch later—fed on the electromagnetic spectrum, which meant that out in space it was floating in a sea of food. Locomotion? N known. Possibly rides the stellar winds in space, which would account for its hitching a ride on the freighter; it couldn't buck the solar

wind alone. Reproduction? N known, period. Reason for being? No living thing can answer that. Description?

Well, when we disembarked from the freighter there it was, clinging to the hull, to the incredulity of the officers and the jetport mechs. It reminded me of a Myxomycete, a "slime mold." I'd studied at Trinity college; if it was anything analogous to that Order the reproduction question was answered; by spore formation. It was a giant flat slab of cytoplasm, about the size of a three-by-five scatter-rug, translucent, and you could see thousands of nuclei inside, all connected with a demented lacework of I don't know what. And the nuclei twinkled at you as though the thing was sharing a joke.

Naturally I insisted on taking it along with us, to Natoma's horror—it filled her with revulsion—but Hic-Haec-Hoc fell in love with Twinkles and slung it over his shoulders like a cape. Twinkles extruded its edges to get comfortable and blinked at Hic, and damned if Hic didn't blink back. I was glad that Hic had at last found a friend. Twink wasn't immobile. It would take off from Hic, flapping its edges like a buzzard and go exploring. Then it would return and they had long conversations.

We'd put down just outside Mexas City, which had ordered the compost, and we took a transit into the city to catch a linear north. The transit crashed and Nat leaped to shield me. My pride was hurt. She snapped, "Big L," and that settled it. We flagged a free hire-pogo ambling back from the port and instead of landing in Mexas City it pancaked with a smash. My wife again. At the linear port a fuel reserve blew up and we had to scatter. I'd twigged by this time.

"He's up," I said to Natoma.

She nodded silently. She knew who and what I meant, and it hurt her.

"The Extro network is in action again."

"But how does it know where we are?"

"The freighter probably snitched. Now the network is gunning for us."

"We're being attacked?"

"Y. All out."

"What do we do?"

"Stay away from machines and electronics. Go north on foot."

"A thousand miles?"

"Maybe we can dig up some safe transport on the way."

"But won't Mexas City report where we're going?"

"N. Only that we're leaving. They won't know where we're going and we're not going to let them know. This is going to be a tough ordeal for us. From here on we don't talk, not a word. Hic will lead us; the Extro can't pick up anything from him, and I'll instruct him with signs." I got out a slip of

paper (a banknote, actually) and wrote: "And any time we pass a piece of electronics we smash it."

She nodded silently and we moved it out of Mexas City, me silently and patiently instructing Hic-Haec-Hoc meanwhile. He finally got the idea, took the lead, and we became a lost army of three. I didn't count Twink.

It was v. interesting. I could tell when we were approaching a town of any size when its broadcasts appeared, flickering before us like a mirage. We hoofed it to Queretaro where our Fearful Leader was sent in and picked up three horses. I'd given him cash along with my instructions but he probably didn't know what it was for, and most assuredly stole the nags. We rode bareback until San Luis Potosi where Hic stole a small wagon. Nat plaited makeshift cords for a makeshift harness. In Durango the Fearful Leader didn't do so well. I'd grunted and signed "knives" to him. Apparently he didn't get the message. He brought us two hammers and a shingling hatchet, but at least that made the destruction easier.

The army was spreading a trail of electronic demolition like Sherman's March to the Sea, but the network couldn't know it was us; machines are always breaking down for the sake of deserving Repair Syndicates. We camped nights with a sagebrush fire and roasted everything Hic and I could forage. It was tough. We had no cooking or eating utensils. We got water by crushing cactus, century plant and prickly pear between flat stones, but we had nothing to store it in.

Then we got a break; we passed an abandoned dump. I explored the rusting, molding rubbish and, Hallelujah: produced cooking and eating tools from forgotten automobile parts; two deep old fenders, eight hub caps (for plates), and a gasoline tank which I had to hammer loose from the remains of a chassis. That was for water storage. I hammered one of the fenders flattish for a fry pan, and raised the sides of the other for a stew pot. We were in business.

Now we really foraged. Natoma taught me how to catch rabbits, Indian style. When she spotted a big jack sitting up and surveying the terrain, she'd give me the sign and I'd sort of meander past, not getting within spooking distance. The jack would keep his eyes on me suspiciously while I wandered about aimlessly. Meanwhile Nat was creeping up on him from behind. A quick grab and she had him; not always but often enough.

We had a windfall once. We'd just crossed a dry arroyo when I noticed black clouds laced with lightning many miles to our left. I stopped the party, pointed to the distant storm, then to the arroyo and lastly to the gas tank. We waited. We waited. We waited. Then there was a distant rumble

followed by a growing roar, and a foaming flash flood torrented down the arroyo. I washed the gas tank repeatedly and finally filled it. The water was full of sediment but it was potable. Then came the windfall; a thrashing, kicking sheep was borne down to us by the boiling water. I grabbed a leg. Natoma grabbed the other. We hauled it out. I now draw the curtain on the messy business of skinning and butchering a sheep with a shingling hatchet.

Curiously enough, Twink didn't seem to need any food, and that's when I first began to suspect that it was feeding on something outlandish like high-tension wires. It had intelligence. After a week of watching Hic and me foraging it got a piece of the idea. It would blink at Fearful Leader—I wish I knew what language they were blinking—and take off. It would return with all sorts of junk clutched to its plasm: rocks, sage, dead branches, bleached bones, a bottle turned purple by the sun . . . but one glorious evening it brought back a thirty-pound peccary. More hatchet work.

Ozymandias crashed in on us the night we'd caught a twenty pound armadillo and were wondering how to cook it. I don't exaggerate his advent. It was heralded by approaching bangs, crunches, breakage, flounderings; it sounded like a blind brontosaurus blundering through a jungle. Then he appeared in the firelight, threw his arms wide, knocking over a cactus, and nearly tripped into the fire.

Merlin nicknamed him Ozymandias from the last sentence of Shelley's poem: *Round the decay of that colossal wreck, boundless and bare the lone and level sands stretch far away.* Oz was colossal. He stood two meters high and weighed 150 kilos. (That's 6′6+″ & 330+ lbs.) He was a wreck. He's eaten and drunk his way around the entire System hundreds of times, leaving lone and level sands where once fine food flourished. He was also a wrecker. Oz can't go anywhere or do anything without breaking something, including himself. Hardly an asset for our expedition, but I was grateful to him for rallying 'round.

He's strictly a metropnik—you never find him outside of a Center City—and his idea of action clothes for the wilderness was hilarious; heavy mountaineering boots, tasseled wool stockings, leather shorts, canvas safari coat and a Tyrolean hat, including shaving brush. But the dear maladroit had an impressive hunting knife hung from his hip, and that would come in handy. He had a rucksack slung over one shoulder, and from the bulges I could tell it was filled with wine bottles. From the spreading stain and steady red drip I could also tell that at least one of them had been broken already.

Ozymandias opened his mouth

for a hearty roar of greeting but I signed him off. He shut his mouth, winced and felt his tongue. Bit it, no doubt. From then on our conversation was conducted written on banknotes, like a couple of deaf Beethovens. I won't reproduce our shorthand, and anyway Oz broke my stylus. What it got down to was this: The Group knew I was fetching Hic-Haec-Hoc, and Pepys told them Hic was on Titan. Oz did something v. brilliant, he thought, he sent a reply-paid telex to the Titan authorities requesting the return date and destination of Edward Curzon and wife. But—clever, clever—Oz used an alias. The information was sent, and that's how the network knew. Oz picked up our trail of smashed electronics, he's not altogether a nudnik, and followed. He surmised that others might do the same.

He greeted us all the same way: hugged, kissed and tossed us into the air. Oz is a tosser. You have to be prepared to land on your feet; as often as not he misses his catch. He fell in love with Natoma at first sight; he's always falling in love at first sight. He was taken aback by Twink but tossed it anyway. No kissing. When I asked his advice about the armadillo he was assured and brief, "Roast it in the shell." Then he inspected the rucksack, pulled out a broken bottle and wept, pointing to the label. Vosne-Romanee Conti, the finest and rarest of burgundies. However, he cheered up the next moment, shrugged, laughed, tossed the broken bottle in the air and threw it away, cutting himself in the process.

We had a transport difficulty with Ozymandias. He couldn't ride a horse; he'd break its back. Natoma got out of the wagon to ride the horse I'd been on (the other two were hitched to the wagon) and Oz got in. He overturned it, scattering our gear. We put it all together and Oz tried again. This time I made him crawl over the tail and sit. It worked. We were now a lost army of four, on the march.

We proceeded to Obregon where Hillel picked us up. He was in a hover, took one look at our scene and didn't stop. Acute and fast. He'd no doubt smashed the instrumentation and I couldn't understand his exaggerated caution. He went straight on over the horizon as though he'd seen nothing. We heard an explosion and a half-hour later Hilly came running back to us. Then I understood. His left arm was gone. I was aghast.

The Jew nodded and smiled.

"The Rajah?"

"Y."

"How?"

"Too complicated for writing. It was brilliant."

"But you escaped."

"At a price. Poulos was the warning."

"Regeneration?"

"Perhaps. You're next. Be careful."

"W?"

"He's killing in descending order."

Hilly spoke a greeting to the horror-stricken Natoma with his eyes, popped a handful of candy into Hic's mouth, patted Ozymandias on the cheek and examined Twink with fascination. Twink had never come across a three-limbed Terran before and had to explore the Hebe. Hilly twitched through the examination as though he were receiving electric shocks. Then he took off and was gone for a few hours while we rested and I tried to stop Natoma from crying. One produced a Flute d'Amour from his rucksack and played sweet, mellow sounds.

Hilly rode back on a vintage bicycle which he'd promoted somehow, and the array continued on to Chihuahua where M'bantu joined the party. Five deaf Beethovens. McBee left us and returned, riding a donkey, his long legs scraping the ground. Twink was bewildered by M'bantu's color and had to examine, naturally. The Zulu understood and immediately stripped. He twitched and jerked through the inspection and finally went over in a dead faint. We pulled Twink off his head and hovered over the Zulu, doing things, until he recovered consciousness. When he'd regained some strength I wrote, "Suffocated?"

"N. Brain drain. Lost brain energy."

"Sucked out by it?"

"Y."

"Electro nerve charge?"

"Y. Don't let it come near you naked."

"W naked?"

"Clothes insulate a little."

By now our silent army was foraging a path nearly a half-mile wide and destroying any possible tattletale machine. M'bantu was an old hand at living off the land and brought in a delightful change of diet: wild yams, wild onions, wild parsley, lily bulbs, parsnip and strange roots. Hilly, smart as ever, had the sense to bring in a few pounds of rock salt. I must explain that although a Moleman can consume anything, we do prefer good food. Ozymandias proved himself to be a master-chef and improvisor.

Erik the Red joined us outside Hermosillo, and that will give you some idea of the continuous zig-zag course we were pursuing. We had to wetback it across the Rio de la Concepcion to Nogales but we were grateful to have a wash, even in polluted water. We had to leave all our heavy gear behind but we hoped to live off the land as before. We were dreamers.

The farther north we got the more pop. ex. we encountered plus all the mecho-electronic amenities which civilized people demand and take for granted today. We started

to travel by night, holing up in obscure places by day, always in the same deadly silence. No more smashing anything. Too much to destroy. We turned into Artful Dodgers.

Between Chula Vista Del Mar and San Diego, Erik left us one rest period and returned an hour later and gestured us to follow him. We follow. He led us to a railroad track and an abandoned hand-flat-car. We got on and began pumping our way north, taking turns. It was exhausting work and I was grateful when we ran out of track south of San Diego.

We camped and M'bantu left us. He returned, yanking a camel, two zebras and a buffalo after him, persuading them to cooperate in animal language. No doubt stolen from the San Diego Zoo. We were now mounted again. North to San Clemente (now a national shrine) where Oz left us and returned slightly damaged with emphatic gestures to follow him. We obey. He led us to a wharf and an empty lifeboat. We rowed north up the coast. Exhausting work and murder on the hands and ass. Thank heaven the leaky relic foundered off Laguna (another tribute to The Wrecker) and we had to swim ashore, me hauling Hic-Haec-Hoc in a cross-chest carry. He could breathe water but the idiot had never learned to swim.

We stripped to let our clothes dry in the sun and lay down to rest, with the exception of Twink who took off to explore the sea. The last I saw of Twink before I fell asleep it was soaring up out of the water with a furious dolphin flopping away at its plasm. When I opened my eyes again there was a majestic diva in a scarlet caftan standing over us. Queenie.

"Well," he said. "Trespassing on my private cruising ground. I didn't know you were so well-hung, G—" At this point he was cut off by Hilly's hand over his mouth. With a finger Hilly wrote in the sand, "N talk."

"W?" Queenie wrote.

"Extro."

"&?"

"On way to kill it."

"Knows you're here?"

"Hopefully, N."

"That's why you can't talk?"

"Y. Or go near electronics."

"Can help?"

"Y. Stay here and be conspicuous."

"Always am."

"Be more so now."

"Decoy?"

"Y."

Hillel tramped out the sand-writing and Queenie sashayed off to be hit in the head with a live skate dropped by Twink. "You—you thing!" Queenie cried. He didn't know how right he was. The beach was littered with Twink's catches.

I felt it was my turn to promote some silent transport. I got into my tutta and took off inland. When I

returned two hours later they were all up, dried out, dressed and having a ball chattering with each other on the sand. I made *suivez moi* gestures and they followed me to a small vintage airport where a huge sign in seven languages read: SEE THE SIGHTS SLOW AND COMFY IN A IZVOZCHIK GLIGER. N GUARANTEE. N LIABILITY. N REFUNDS.

We got into the sailplane, the pilot followed, counted heads, nodded and sat down at the controls. A decrepit World War Two jet hooked onto us with a hundred-yard cable, took off and dragged the gliger after it. At two thousand feet it unhooked and went home and we were free to see the sights slow and comfy. I nodded to M'bantu who yanked the pilot out of his seat and dragged him aft while I replaced the pilot at the controls.

This was old-hat for me. Fact, not boasting, I'd won a dozen glider rallies when I was a kid of seventy. I rode the thermal updrafts and the southwest wind north while the pilot raged and the Zulu soothed him with a fist. Although the sailplane was mute none of us spoke. It had become a habit.

Damn if I didn't land in the same TV dump where I'd taken two girls home ages ago. It was a messy putdown but no one was hurt except the gliger. We left the pilot burning for satisfaction and took off, but I did see the Red toss a packet of bills onto his chest before he left the plane. We slud out of the dump and through streets to the tepee where the three wolves were still on guard. M'bantu spoke to them and they let us enter. I expected to find Sequoya there. N. Was he up or down?

Now I accelerated. I left in silence, went and bought a multi-burner, a cc of Codeine-Curarine, a jolter and a utilities map, also in silence. I returned to the tepee, jolted myself with a massive shot and memorized the map. I had half an hour before the Codeine-Curarine would hit me. When I had the map by heart I gave my perplexed companions a smile of confidence, which I did not feel, motioned to Hic to follow me and left, still in silence.

I was able to get Hic to the sewer manhole before the drug hit me. He was still carrying Twink on him but I didn't object. I wasn't going to break up a beautiful friendship. We went down into the sewer and started crawling toward Union Carbide when the Codeine-Curarine bombed me.

What it does is splinter the psyche. I was fifteen, twenty, fifty people with their memories and hang-ups; dreaming, angry, trusting, frightened. I was a population. If the Extro network was aware of me it would have as much trouble sorting out who I was and what I was up to, as it would have with Hic-Haec-Hoc. Codeine-Curarine is

deadly fatal, but not for a Moleman. However, a lot of bods shoot it for that one last kick.

The one percent of the realsie me led us through the sewer, counting yardage until we came to the approx. spot. Out the burner and cut hatch through top. Not bad. Plastic conduit N far off. Ear to. Rushing wind. Exhaust for Extro complex air-con. Burn. In. Crawl. *La mia mamma mi vuol bene. Einen zum Ritter schlagen.* Oh, Daddy, I want to die. *L'enlevement des Sabines. Shtoh nah stolyeh?* Hold on thar, stranger. *Una historia insipida.* Your son will never walk again. How do you feel about that? *Merde.* Agooga, agooga, agooga. Like sing out dulce Spangland.

Knock/oh jazz/head/oh jazz/ against grille/this is the consequence/look/of ill-advised asperity/computer complex below/*arte magistra*/empty W?/Vrroom/grille must go/give me liberty/too strong for me/or give me/out burner/ burn/or give me W?/pull grille back/slide out and drop ten feet to floor followed by gorill who probably/*sholem aleichem*/wants to mug me/look around look around nothing in complex W? H?

Look at gorill. Look familiar. Punch-drunk fighter. One percent me now becoming ten percent. Very nice edge, Capo Rip always said. Who? Rings a bell. I'm dying, Egypt. N, can't kill a brother. A what? But going to kill one now. N. The Extro. Kill the Extro. *Si. Oui. Ja.* Kill the Extro. Hic, kill the Extro. Why we're here. Hic, with your bare hands; rip, tear, break, smash. Hic, kill the Extro. That's it over there, center. And Sequoya came out from behind the Extro. Suddenly I was all me.

"Hi, Guig," he said pleasantly. The three seven-foot cryos came out and joined him, emitting their radar music. They were wearing maladroit homemade coveralls.

"Hi, Geronimo," I said, trying to match his poise. "You knew I was coming?"

"Hell, no! We picked something up from the conduit through cable crosstalk but it sounded like a hundred bods. You?"

"Y."

"How'd you do it?"

"Codeine-Curarine."

"Clever. I've been plagued by lunacy from the Extro ever since I came up. You?"

"N."

"Who's that with you?"

"Oldest member of the Group. Hic-Haec-Hoc."

"Ah yes. The Neanderthaler. What's that cape-thing on his back?"

"A creature we brought back from space."

"No! You don't mean to tell me—"

"I do. Highly advanced exobiology for you to research, if you can persuade Tycho to let you keep it."

At this moment the broadcasts began their regular carrousel of commercials, and the complex filled with men, women, girls, children, doctors, lawyers, cartoon characters, all selling something. It was bedlam and it drove Twink mad with curiosity. It took off to examine the host, but since they were only three-dimensional shadows Twink kept flapping through them.

"I've been waiting for you for ages, Guig."

"Didn't you know where I was?"

"Not after Mexas City." He hesitated. "How is she?"

"Fine. Still angry with our naughty brother."

"She has a temper."

"Why wait for me here, Chief?"

"I had a lot of work, weeks of it, debugging a program for the production of hermo's here on Earth. And I knew you'd show up, sooner or later."

"D'you know why?"

"To make a deal with me and the Extro."

"Including the Rajah?"

"Who?"

"Ah! Then you don't know his identity yet. The renegade killer who's joined forces with the Extro to use you. He's murdered Poulos. He nearly got Hillel. I'm probably next." I turned to Hic and made forceful signs and grunts. He got the idea again, at last, and headed for the Extro. The Injun was perplexed.

"What's all this, Guig?"

"Not a deal, a hit. We're going to take the monkey off your back. We're going to kill the Extro."

He let out a yell that scattered the frightened cryos and made a dive at Hic who was attacking the panels and fascia of the damned machine with his powerful hands. I made a dive at Guess, tackled him knee-high and pulled him down.

There was no need for Sequoya to defend the computer; it had heard everything I said and was defending itself. Lights were shattering, with the fragments aimed down; the air-cond. blew up, more shrapnel; electronic locks on doors and software files burst and barraged us, circuits shorted and high-tension cables came sizzling down. Then the satellite computers were sacrificed. They began to blow up, and it seemed that the Extro would sacrifice every human in the complex, too.

An animal howl from Hic cut through the darkness and dementia. Guess and I froze and stared. One panel had been ripped from the Extro and we saw a lion within, glaring at us. The commercial carrousel cast a confusing kaleidoscopic light on it. After a moment I saw that the lion was standing on its hind legs. After another I saw that it was a man wearing a lion mask. And then I realized it wasn't a mask.

"Oh God! The big L."

"What, Guig? What? What?"

The Chief and I climbed to our feet. "Lepcer . . . The final leonine stage . . . It . . . He . . ."

He shambled out of a dim clearing in the Extro that looked like a small camp walled with electronic units. He was crook-gaited and spastic, yet with ominous power; the strength that comes with loss of control and the agonizing hypersensitivity of terminal Lepcer, the honing of the senses that precedes final anesthesia. And he stank. He filled the center with his big L. Hic-Haec-Hoc whined and disappeared.

"So many years since the spa, my dear Curzon," the Rajah said, poised and courteous as ever. His voice was hoarse and broken, but still sing-song. Chi-chi, they called it nowadays, my mind told me aimlessly as it squealed and darted, trying to escape what had to be faced.

"And this, of course, is the latest addition to the beautiful Group. I was beautiful myself, once. Can you believe it, Dr. Guess? Yes, I know you. I have been watching you from the shadows for some time. I have been watching the entire Group. Give Dr. Guess my name, Curzon. My name and rank."

It took all my courage to speak. "His Serene Highness, Prince Mahadeva Kauravas Bhina Arjuna, Maharajah of Bharat. The Group calls him The Rajah."

"Delighted, Dr. Guess. I do not offer to shake hands or smite palms. Royal princes do not so greet commoners. It might be permitted to kiss my hand, but the touch of my skin is loathsome, even to myself. My dear Curzon, you did not tell him that I am also the avatar, the transfiguration of Siva on Earth."

"I didn't know, sir. Apologies." My heart was watery but I was not to be outdone in poise. "So the renegade is really you, your Serene Highness. I could not believe it when Hillel told me."

"Renegade, Curzon? Only a Jew unbeliever would say that. God, Curzon." Abruptly he bawled, "God, Curzon. The divine Siva. We are Siva!"

I was convinced at last. Lepcer was the missing factor. The big L had turned an exquisite into a malignant enemy; stalking, lurking, destroying, literally a lion.

"I congratulate you on your choice of a hiding place, Rajah," I said. "Your command post at the center of action? No one would ever dream of looking for you here. How did you make room for yourself in that damned clutter?"

"Discarded a few units, Curzon. It was less than a prefrontal lobotomy for the Extro, although it protested. Why is your pulse chattering, Dr. Guess? Are you fearful of Siva? Deny nothing. I hear it. I see it. A god senses all; everything is known, and this is why Siva's destruction and creation are received

with humility and love. Yes, humility and love for my destruction and regeneration of the void."

"God in heaven!" I burst out. I was shaking. "Where is the regeneration for Fee, Poulos, Hillel's arm, my home. Our—"

"Alas, not the little girl. That was before my advent. The Greek, yes; a beautiful death. The Jew escaped me, but not a second time. No one escapes Siva twice."

"Alas, not the little girl?" Sequoya repeated in a choked voice. "Alas, not the little girl! Alas?"

"Humility and love, Dr. Guess. It is the true worship of Siva." Suddenly he raged in the Chief's face. "Humility and love! I am the all, the one, the destruction and regeneration, and the linga is my sacred symbol. See! See with humility and love."

He displayed his enormous, rotting symbol. We backed away in revulsion.

Abruptly the rage was replaced by sweet reason. "You will love me even as I destroy you, for I am the worker of miracles by virtue of the penance and meditation of fifty years."

"You've suffered from Lepcer for fifty years, Rajah? I—" But I was stammering so badly that I had to stop.

The lion head nodded graciously. The lion face almost smiled. "It is permitted to address me by that name, my dear Curzon. Siva is only one of a thousand names. Above all, we prefer Nataraja, the Cosmic Dancer. So we are most often idealized in sacred images."

He uttered a croaking, sawing song, "*Ga-ma pa-da-ma pa-ga-ma ga-ri-sa ni-sa-ni ga-ri-sa . . .*" This is in a slow 4/8 and 3/2 rhythm. Then faster, "*Di na a na di na a na di na a na ka a ga a ka ga dhina na dhina na dhina-gana . . .*"

And he danced to it; solemn ritual stances, quick jerking movements and pauses for poses; around us, around the Extro center, through the broadcast bedlam, through the debris and the crackling sparks of the shorted cables. He danced his Cosmic Dance with the convulsive frenzy of a drunken rubber doll with arms, legs, hands and feet that seemed to bend the wrong way and flung their own debris. Each time he jerked his head left and right, tatters of hair scattered. Nails dropped off his fingers and toes. Each gasp for breath sprayed blood.

"This is the horror that's been using me?" Sequoya squeezed out.

"With the Extro," I mumbled. "Make a charming couple."

"I'll take the damned machine. You take the damned god."

"Wilco. Give the word."

We were both in a fever. The Rajah swept up to us, "*Dhina na dhina na dhinagana . . .*" the lion face twisting at us as hypnotic as the dance. The rubbery arms swung wide with tremendous power and knocked us apart.

"Now!" the Chief exploded, stumbled to the Extro and began tearing at it. The burner was slung around my neck and I swung it forward to make the hit. It had to be a brain or heart shot. Siva was posturing before me in a sacred pose, arms high, hands cocked down, but there was a Katar in one hand, sidebars protecting the sides of the wrist, fist clenched around the cross-piece, and the broad blade punched down at my heart. All the hypnotic singing and Cosmic dancing for this one moment.

I was completely unprepared, but the burner saved me. I'd swung it before my chest and the Katar plunged through it and muscle-deep into me. The burner shattered, blew widdershins and I went over backward with the Rajah all over me; one blunted hand crunching my neck, the Katar thrusting at me like a goring bull. I thrashed desperately, trying to escape a severed throat or a split heart. I couldn't yell to Guess for help and I was blacking out when I was released as unexpectedly as I'd been attacked.

There was the Rajah, squirming and hissing in Hic's hands. Hic loyal? Helpful? Imposs. It must have been the instinctive hatred and loathing that makes so many animals turn on their sick and rend them. Hic transferred his powerful grip to the lion head, held it firm, and whirled the body in a tremendous circle around the neck. There was one *crack*.

I gimped to my feet again, staring. Hic had hit the wrong target, and yet it was the right one. Only there were two bodies. The other was Sequoya with Twink wrapped around his head. Much later I reasoned that its electrotropism must have been attracted by the powerful combination of Uncas and the Extro; particularly after the frustration of the shadow broadcasts.

A strong voice spoke. "That's enough, Curzon. He's dead. Get that thing off."

"Dead? No. I wanted—" Then I looked around in bewilderment. One of the cryos repeated, "Get that thing off."

"But . . . but you can't talk."

"We can now. We're the Extro. Get the thing off Guess. Quick, Curzon. Move!"

I pulled Twink off the Chief.

"And no more demolition. Don't let your friend start again."

"Give me a good reason."

"We're in control now. It's shifted to us. You know us. Will we permit it to go on making war?"

It was a quick decision and a tough one. I pulled Hic back from the Extro (he'd probably forgotten his mission anyway) and let him keep company with Twink again. The cryos knelt around the Chief and examined him with hands and ears.

"Dead, all right."

"Everything's stopped."

"No, the heart is still spasming."

"That's like the case with electrocution."

"We'll have to regulate it again. That's the least we can try."

I wondered whether they were speaking from their own knowledge or the Extro's; probably the latter, which was all right provided the hateful thing was properly humbled. They began the damnedest cycle of operations. The Chief was pummeled, bent, flexed, stretched, lofted, dangled, prone-pressured and mouth-to-mouthed; always in the identical tempo, 78 to the minute. My own pulse was running much faster. At last they stopped and put ears to the Chief's chest.

"Nominal," they said. "We've got him back from the edge." They looked around with their blind eyes.

"I'm here," I said. "He's going to live?"

"For a long time. Do you trust us, Curzon?"

"I have to, don't I?"

"No. You can kill us easily. If that's the way you want it, get it over with now."

"After that, I trust you."

"Ta. We won't let you down. We'll make the Extro behave. Why lose it?"

"Why indeed."

"We're going to repay your trust. Give us all available data on Lepcer. Maybe the Extro can suggest a line of research leading to a remedy. Don't count on it."

"Thank you."

"Try to get some viable tissue from the remains of that girl to us. It may not be too late for cloning. Don't count on it."

"Would you lovable freaks care for a few bars of 'Hail the Chief'?"

They burst out laughing. "Take Guess, Curzon. He's all yours. Keep in touch."

I knelt alongside Guess. "Cherokee," I said, "it's me, your brother. Everything's going to be gung."

"Ha-ja-ja," he burbled.

"You're rid of the Extro. The cryos have taken it over and I believe they can be trusted to do right."

"Ha-ja-ja."

I looked at the cryos who were busy restoring the damage Hic and the Chief had begun. "Hey, bods, he sounds like a baby."

"Oh, he is, Curzon. When the Extro pulled out it left nothing behind. He'll have to grow up all

over again. Not to worry. He has plenty of time."

15.

Hic had to help me carry Sequoya out. The Chief couldn't walk. He couldn't talk. He was helpless. And he relieved himself in his tutta; he'd have to be diapered. I was relieved to get out of the complex before the cryos asked me to get rid of the Rajah. I flagged a pogo, we hauled Tecumseh in and made the tepee in one jump. The Group was waiting there, worried and tense. When they saw us lug the infant in they were flabbergasted.

"It's all over now," I said wearily. "We can talk and think out loud. We can take transport. We can do any damn thing we please. No more war."

"But what happened to Guess?"

"He'll be his old self in about twenty years. Just now all he needs is cleaning up. Give me a stiff belt and I'll tell you the whole story."

I tell and they listen, taking turns looking over the six-foot baby. Natoma was so fascinated by the events and so relieved that our brother had come out of the crisis alive that she forgot to be upset by his regression. All of them were delighted by the end of the Rajah threat, particularly Hilly, and no wonder.

I could see Hilly wanted to thank Hic-Haec-Hoc, but he knew better. There was no doubt that the Neanderthaler had forgotten all about it by now.

I said, "I know you all want to leave and go about your business, but please stay a little longer. I have one more mission and I may need your help afterward."

"What is it?" Ozymandias asked in an asthmatic voice as thick as his body.

I told them about the cryo offer.

"Too late," Hilly said. "I'm sorry. She's been in too long."

"I've got to try anyway. There's always hope."

"Not much."

"It's too dark, Guig. Dangerous. Wait until morning."

"The longer I delay, the less hope."

"Don't go, Edward. You'll never find her."

"I've got to try, Nat."

"Please listen to me. I—"

"Damn it, don't you think I know it's a ghoulish search?" I shouted. "I know it's a rotten job, but I've got to try and get a part of the body for DNA-cloning. If you can't support me in my try because you're jealous or whatever at least don't dissupport me, or whatever I mean."

"You've made yourself v. clear, Edward."

"R. Forgive my manners. I've had a hell of a day and the worst is yet to come."

"We'll go with you," M'bantu offered.

"Thank you, no. More than one

would only make it easier for a patrol chopper to spot us. I'll go it alone. Sit tight, all. I'll probably need you for messenger service. Back in an hour."

I took a pogo to the edge of the burial ground and as I got out a chopper thrummed overhead playing its brilliant beam down and around. The light held on me for a moment and then moved on. I had no idea when the patrol would be back. It depended on how many private ops it had to police.

It was night. It was nightugly, not because of the fear of death but from the revulsion of the living for rot and decay. You could smell the decomposition choking you as you approached; ammonia, nitrates, potash, phosphates, carrion putrefaction. Death couldn't be wasted these days; every end-product of life went into compost.

El Arrivederci (Till we meet again) filled about five acres—the public composts occupied ten times that space—and used the concrete foundations of the old Waldorf West Hotel which had been torn down fifty years ago to make room for an office complex never built. The two thousand evictees had blocked the entire undertaking with a Squatter's Rights lawsuit. The case had not yet come to trial and most of the parties concerned were rotting in composts themselves. Progress.

The foundations look like a squared-off labyrinth; odd-sized boxes, squares, rectangles, even a few diamonds and pentagons, depending on what stress supports the original architects had designed. They were concrete walls, six feet high, three feet wide and flat on top providing a walkway for workmen and funeral corteges. There weren't many of the latter. You go to a compost once and never again, and the word gets around. The corpses are layered in with other organic refuse and chemicals, and the piles are kept flat on top to collect rain. After a long wet spell bones thrust up out of the decay.

Bones are always a nuisance when it comes time to empty a pit and ship the matured compost out. There's a giant steel mesh mounted on pillars in the loading area. It's used to screen out the coarse rubbish, and the heaped bones and skulls make it look like a *Danse Macabre.* I'd seen all that the day I followed Fee-5's body to the pit to make sure she was treated respectfully.

This was night. The night was dry . . . the whole week had been dry . . . and I was startled by the "fire-fang," as it's called, shuddering in some of the pits. It's generated by the intense heat of fermentation and the flames were party-colored from the chemicals. I could see by the light of the fire-fang and didn't need the lampland torch I'd brought to find my way.

I threaded across the compost on the walkways to the small pit

where I remembered Fee being placed. The miasma was strangling me. The pit was dark, no flames, so I switched on the torch. Just a flat surface of straw some three feet below. I steadied my nerve and dropped down. The straw was spongy. The heat was burning, and I knew I'd have to work fast or I'd be roasted unconscious. I clawed the straw aside, reached a layer of crushed limestone, shoveled that back with my hands, and there was a bloated body, peeling, shredding, rotting. Not Fee. A man. I vomited.

He must have come in after Fee. You've got to move him. Move him, Guig. Be a mensch and move him. I braced myself and used a foot to roll him out of the way and he came apart at the joints, emitting a gangrenous gas. I retched bile. Underneath him was a layer of dried blood, and under that was another large adult in the final stages of decomposition. Only a few fragments of skin and patches of hair adhered to the loose skeleton. *If Fee's under that she must be gone if it's gone. Gone forever, Guig. Hopeless. Don't count on it, they said . . .* I dry-retched again.

A voice cackled in Spang, "Bod doan dig it."

Another, "Nobod tell'm us leave nothin'?"

I flashed the lampland up. Three wild grotesques bright against the black sky. Grave robbers, flashing with corpse-jewels.

"Got a union card, bod?" the third called.

They dropped down into the pit. They were armed with heavy femurs and I would make an addition to the compost, alive or dead. I had no weapon and I backed away from their advance, reaching for whatever valuables I had on me to toss to them. I kept the light in their eyes to blind them but they merely squinted and hefted the thigh bones. We'll meet again v. soon, Fee.

My digging must have introduced enough air into the compost to trigger combustion. A flicker of fire-fang welled up from the cavity and spread over the entire pit. The three goons went up a wall, burning. I went up the opposite wall, burning. While they were putting themselves out, I got myself out of *El Arrivederci.* Only then did I start slapping and beating.

I didn't have to do any talking when I rejoined the Group in the tepee. They knew. They didn't ask questions, even about the condition I was in; clothes nearly burned off, hair nearly burned off, blistering and stinking of compost. They got up quietly, took a last look at the Chief who'd been cleaned up, and whispered their sympathy to Natoma. Then they left to return to their own lifestyles. Why did they whisper? It wasn't a funeral; just a delay in Sequoya's life. Y. I'm so smart. There was a delay in mine coming, too.

"I'll have to help you bathe and change," Natoma smiled. "I have two babies on my hands."

"Thank you. This one is a v. tired baby."

"And then you'll sleep."

"I don't dare, love. If I go to sleep now it'll be for a week. We've got to get our brother home first."

"That's not wise, Edward. You're still driving too hard."

"I know you're right. I–you were right about Fee. I should have listened."

"You don't know how right," she said in a curious tone. I was too exhausted to make anything of it.

"But please let me wrap up the whole package tonight. Then we can be together again, alone. You don't know how I've missed you."

It was hell for Mr. and Ms. Edward Curzon getting brother into another pogo and worse getting him into a linear to Erie and off. The Shoshones were on duty at the west gate and they lent a hand without asking any questions, for which I gave them good marks. They hovered us to the marble wickiup, carried Sequoya in and put him down on a couch. He wet the couch. Mama looked him over and began to sob in Cherokee. The kids ran in, wide-eyed. Mama snapped an order at them. They ran out and in a few moments the Sachem entered. He looked.

"It's all yours," I said to Natoma. "You'll have to explain. Give them as much of the picture as they'll be able to understand. I don't think you should mention the Moleman bit. That's too much."

I left, went to the wall where Sequoya and I had sat together so long ago, and let the sun warm me. After a couple of hours Natoma came out, looked around, found me and came and sat down alongside me. She was subdued and depressed. I didn't say anything.

At last she said, "I explained."

"I knew you could. What did you tell them?"

"That you and my brother were doing scientific research with a computer and he had an accident."

"Good enough. How did they take it?"

"Not very well."

"I don't blame them. Their splendid, brilliant son. I hope they live long enough to see him become what he was."

"My father says this would never have happened if he hadn't met you."

"I never knew it would turn out like this. How could I? Grant me that."

"My father says you have taken his son away from him."

I sighed.

"My father says now you must replace him."

"What!"

"You must be his son."

"How?"

"Here."

"Stay on the reservation?"

"Yes. Here. In Erie. You must never leave."

"Dio!"

"And Sequoya will be your son. You must raise him and bring him back to what he was."

"But that will take years out of my life."

"Yes."

"That's a hell of a sacrifice."

"Yes, but what about mine?"

"Yours?"

"I'll have to become a squaw again."

"Not to me. Never."

"But to Erie, always."

"Dearest love, he's in good hands. We can go away; to Brazil, Ceres, the Corridor, Mexas, Africa. We have the whole Solar System before us and you haven't seen part of it yet. Yes?"

"No, Edward. I must stay and help, but you can go away."

"From you? Never."

"Then you'll stay and do what father says?"

"Yes, damn it. God damn it, yes, I'll stay, and you knew I would. All this pussy-footing around!"

She looked at her naked toes. "I love you for a hundred reasons. Most now because you never let me down. You never will."

"Never."

"Now I'll tell you something I promised never to tell. It's your reward."

"I don't want any rewards for doing the right thing."

"I knew you'd never find Fee's body."

"And you were right."

"Because I knew it was gone."

"I don't understand."

"After she was killed and you were suffering so, Jacy took you out to comfort you."

"I remember."

"Borgia and I went to the compost. I wanted Fee buried in a private grave just for you. Borgia said no and talked about rebirth."

"What? DNA-Cloning?"

"Y. She said we were in time and she got Fee back. It cost an enormous bribe."

"And you never told me."

"Borgia said it was so iffy that she didn't want to get your hopes up. She made me promise. Anyway I couldn't understand what she was talking about. My XX wasn't v. good then."

My heart began to pound. "So? Now?"

"She said she'd write and report progress."

"And?"

"She hasn't yet."

"Then I can hope. I–I can't tell you how grate–And I made that vicious crack about jealousy."

"I'll forgive you if you'll forgive me."

"No bargains. It's just us together, forever."

"Not quite," she said solemnly. "I'll grow old and die, of course, while you go on forever. That's what hurts most. It must have tor-

tured poor Fee who didn't even have—but I know you'll be with me to the end. Who else would you have to take care of you?"

"We don't have to think about that for a long time."

"You'll probably want to run away."

"Probably, but I won't."

"They'll all believe I'm your mother."

"Or a rich old lady I married for her money."

She giggled a little. "Why didn't you ever hook up with one of the eternal ladies?"

"I suppose because I prefer human beings. The Group isn't really human, you know."

"You are."

"We have a long time before us in Erie—we can take vacations, I hope, and see the Solar—so you may change your mind about that."

She smiled. "I'll go tell my father. Meet you in the tree in an hour."

"Why not now?"

"I have to help mother bathe and diaper your son."

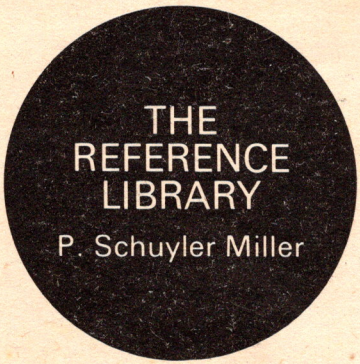
So here I am, here I am in Erie, son of the Mighty Sachem, prince of poppies, fink of firewater, and it's damned hard work. They've renamed me Edward Cochise. I study Cherokee, Ugly synthesis and customs at the college. I obey. I refer all major decisions to the Sachem. I exercise with the braves and submit to their derision. My wife walks three steps behind me with her head lowered. What happens after hours is nobody's business.

I have this recorder on which I'm keeping my journal in XX. I sent word to Pepys, and the Group visits occasionally. M'bantu stayed six weeks and had a glorious time. He made friends with everybody and was formally adopted by the Mandan nation. Tosca came and studied tribal dances for her new production of Salome. Disraeli brought a financial report. Apparently the cryos had forced the Extro to shape up and I was back in business again. I was able to repay the Sachem's loan. Queenie came but the Pawnees on duty wouldn't let him in. He was livid.

I think I'm beginning to gain some clout in Erie. The other day a deputation from the tribes and nations arrived at the wickiup with an internecine problem and they kept addressing me as, "Great Cochise." Next week I go on duty as Chief of the west gate for the first seasonal tourist invasion. Natoma promises to do a paint job on me that will fill them with awe. The Sachem has given us permission to take June off and we're for the Moon.

Dio! My son is crying again. *Escuse* me. ■

The Analytical Laboratory is your chance to tell us which stories you like best. To vote, list the stories in this issue in the order of your preference and send the list to Analog, Condé Nast Building, 350 Madison Avenue, New York City 10017. (For the October results, see page 111.)



THE PLACE OF MAN

Writing on the drama of the pending impeachment on the Op-Ed page of the June 6 *New York Times,* critic Eric Bentley commented: "It is only the unschooled critic who praises a work because it presents an illusion of life." Bentley was referring to drama criticism, and he might not apply the same criterion to criticism of other forms of literature, but from where this admittedly unschooled noncritic sits, it definitely does not apply to science fiction.

Good science fiction does create an illusion of life in very strange places, in strange societies with strange traditions and motives, under strange conditions. So does good fantasy. One of its major functions is to make you believe in what the author is showing you, and, by believing, to understand things you never understood before. Few writers do this as well as Ursula Le Guin, whose "Earthsea" trilogy of fantasies won the National Book Award for Children's Literature, and whose new novel, "The Dispossessed" (Harper & Row, 341 pp, $7.95) still stands as the outstanding science fiction book of 1974.

I picked the title of this column out of another story in the *Times,* describing what our technological society is doing to the life of the Eskimos in a little settlement in the Canadian Arctic—a settlement whose Eskimo name is Inuvik, "place of man." Before our society began to overrun them, the Eskimos were perhaps better adapted to their hostile environment than any other people in the world. Their counterparts and kinsmen in the Siberian Arctic may have shared in this symbiosis of man and place, but the primitives of whom one automatically thinks—the Bushmen of South Africa, the pygmies of the Congo, the Australian aborigines, the Indians of Cape Horn—came nowhere near their adaptation to a cruel climate.

As I read her science fiction, it is Ursula Le Guin's premise that the entire universe is "the place of man"—our Inuvik. We will adapt to what we find there—in social organization and eventually in body. It isn't her message alone; it has been assumed since the first days of science fiction; but she has demonstrated it through her connected sequence of books better than any writer I can think of. Better even than Poul Anderson, whose premise it is also.

"The Dispossessed" is also a demonstration of the falsity of the claim that a novel of character is out of place in science fiction.

The book tells one story on two time tracks. It shows us two planets of Tau Ceti, near-twins rotating around a common center of gravity. Urras, rich and fertile, was found and settled by explorers from Earth more than nine thousand years before, and forgotten again when Earth society tortured itself to death. Anarres, Urras' "moon," is a barren desert world to which a small group of anarchists, followers of the philosopher Odo, withdrew after their founder's death some two centuries before. They started from scratch with a new society, a new economy, even a new synthetic language and in 170 years no Odonian has left their world. Only recently have some malcontents opened communication with Urras.

The book begins when Shevek, an Odonian physicist, is leaving Anarres to accept an award made by the scientists of Urras for his theory of simultaneity. He is almost an outcast on his own world and a curiosity on Urras. In alternate chapters we go back to his boyhood and see how he is shaped by the Odonian society and by his own harsh world, and how he tries to adapt again to capitalist Urras. There are a number of nations on Urras, with languages and societies of which we see very little—one even claims to be an Odonian anarchy like Anarres—but it is the richest, and to Shevek the most corrupt, that has captured him and hopes to use his "secret" for instantaneous space travel that will make Urras and A-Io masters of the nine known worlds where humans live. (We have seen some of these worlds in Mrs. Le Guin's other books.)

The alternating stories come together when Shevek becomes involved in a lower class revolution, hides out in the underground, takes refuge in the Terran embassy, and gives the discovery he has really made—timeless communication through the "ancible" which we have seen in the other books.

"Men cannot leap the great gap, but ideas can," is his message to all men. An idea made Anarres. Other ideas will make other worlds. This is Shevek's message to the observer from the immensely ancient Hainish world who accompanies him back to Anarres. It is one of the basic lessons of anthropology and history, and it is implicit in the best of "realistic" science fiction.

You can read "The Dispossessed" for the foundation it lays for Mrs. Le Guin's other books, but you should read it for itself. I hope that it will somehow

be taken up by young people as Robert Heinlein's "Stranger in a Strange Land" and Frank Herbert's "Dune" have been. It will teach them more about people and about the forces that move and shape them. It will show that anarchy can become ugly and sterile in spite of its philosophical integrity, and not only because it is practiced in a desert. It may disturb them, as it does Shevek, to learn that old Earth looks on the poverty of Urras as richer than anything left on the home world—as poverty in the United States is richer than the desolation of sub-Sahara Africa and India and other lands.

"The Dispossessed" is a book that I expect to be read for a long time, and for many reasons. Every reader will find something different in it every time he takes it up. Perhaps it doesn't present an illusion of life after all. Perhaps it reflects the truth of life and the place of man.

THE INVERTED WORLD

by Christopher Priest • Harper & Row, New York • 1974 • 310 pp. • $7.95

Christopher Priest's "Darkening Island," in its English edition, placed third for the John W. Campbell Memorial Award last year and was rated the outstanding British SF novel of 1972. I don't think his new book will be as well-received, but it is certainly one of the strangest SF novels of all time. Unfortunately the ending lets you down almost as badly as the traditional dream in Nineteenth Century stories.

It isn't that the author doesn't lay the groundwork for his final revelation. He does, quietly and cleverly. But he had built up the strange hyperboloid universe in which the City of Earth laboriously edged its way southward with such persuasiveness that it is infuriating not to have the solution come out of this same creation.

For two centuries after the collapse of technological civilization, the City of Earth has been inching its way across the surface of a terribly strange planet. It is mounted on tracks that are laid down ahead of it and taken up behind it; there is no time and no technology to make new tracks. The world itself is rolling up behind it and spreading out ahead. Down past a few hours become months in the City; people and things not of the City become flattened and extended like images in a funhouse mirror, and a growing force sweeps City rovers into infinity. Up in the future the natives are weirdly strung out and years of exploration are collapsed into days or hours back home.

The author has created a strange society of guilds with rotating membership to fit his weird world. The young hero, born into the Futures Guild that charts the City's tortuous course, serves his apprenticeship in the other guilds in turn. For the City lives off the poverty-stricken natives through whose land it passes, stealing its women as breeding stock, dickering for food and labor, fighting with its superior technology against their primitive defenses. It develops that their world is a kind of shifting hyper-

boloid, and that as in "Alice" they must struggle valiantly to stay in the central zone where physical and chemical laws remain "normal."

I admit that I don't know what the physics of a hyperbolic universe would be. Priest admits that he was assured the physics has a hole you could drive the City through (anyway, a city). I object on geographical grounds; it seems to me that given the track that is finally described, the City would have had to winch its way over one and possibly more major mountain ranges, and that it couldn't have done it. But if its course had been diverted just a little, the difficulty wouldn't have arisen and the final impasse, when the City reaches a sea that it can't bridge as it has the largest rivers, would still be legitimate.

ZENYA

by E. C. Tubb • DAW Books, New York • No. UQ1126 • 157 pp. • 95¢

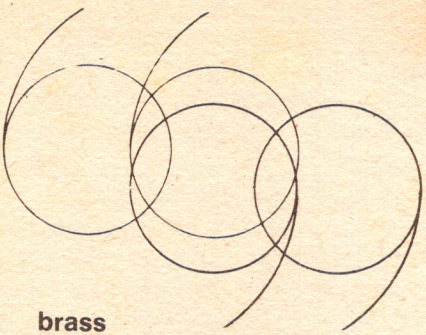
Old readers of this department know that I am a sucker for old-fashioned color-and-action yarns—space opera, if you will, though I prefer what you might call planet opera, full of strange worlds, strange creatures, and strange societies. The "Dumarest" series by the English writer, E. C. Tubb, is for my money the best sustained series in this genre.

Earl Dumarest is a muscle-man as rugged as Conan ever was, and smarter. He was born amid the wreckage of old Earth, a planet long forgotten on the teeming worlds of mankind's Galaxy, and carried off toward the crowded heart by the captain of a tramp freighter. Now, through eleven books, he is trying to find his way back. I haven't read the early books, but I have read the last few and they hold up very well.

There are certain constants: the basic economic and social structure of human society . . . the twin techniques of enduring the slow passage from star to star, in frozen suspension or under time and metabolism distorting drugs if you can afford them . . . the red-robed cyborgian brotherhood of the Cyclan who are hunting Dumarest from world to world because of a secret he once learned . . . the still mysterious monks of the Universal Brotherhood, of whom future books will doubtless tell us more.

Here Dumarest is tricked into taking service with the ruthless Aihult Chan Parect of Paiyar and sent to find Parect's runaway son on the war-stricken little planet of Chard. Posing as a mercenary leader, he takes over command of their savage war with the aborigines, and finds loose ends where there should be none. So there is a mystery to be solved, a quest to be fulfilled, and any amount of double-dealing to avoid, evade and overcome. Zenya, granddaughter of the insane Chan Parect, is only one of two women who entangle themselves in the affairs of the lusty man-of-many-worlds.

The intrigue is suitably tortuous, the action is fast and bloody, things and people are never quite what they seem, and Earl Dumarest improves as he gets closer and closer to Earth.



brass tacks

Dear Ben:

There aren't many political issues science fiction readers can all agree on, but I think I've found one that ought to be nearly universal.

Readers of my latest stories will have noted that I'm interested in dolphins. Unfortunately, so is the tuna fishing industry. There is a highly successful fishing technique known as "porpoise fishing" which has replaced the old hook-and-line catching system formerly employed.

Porpoise fishing consists of herding dophins with speedboats. The tuna follow the dolphin into a purse seine net. The net is drawn closed, catching the tuna—and killing a lot of the dolphins. In 1972 Congress tried to do something about it, and a somewhat better net was developed. Now only hundreds of thousands of dolphins are killed each year instead of millions.

Many of the victims are the young dolphins, and pregnant females. I don't think you want to know the details, which are pretty gruesome.

If this bothers any of you, you can do two things. First, write your Congressman and tell him you're willing to pay another dime a can for tuna if they'll stop killing our seagoing cousins in catching them. Second, send $3.00 to The Porpoise News, 1945 Twentieth Avenue, San Francisco, California 94116. They're trying to spread the word. You get a newsletter and they get a chance to tell more people what's going on.

If you really feel strongly about it, look at the tuna can, and buy only albacore and skipjack tuna. They're hard to find, but these varieties are apparently caught without threat to the dolphins.

I find it hard to write about this, because I feel nauseated and want to cry all at the same time. You know, ten percent of Analog's readers are enough to generate so many letters that Congress will take a real hard look at this situation. I hope some of you feel the same way I do.

JERRY POURNELLE

First the blue whales, now the dolphins?

Dear Mr. Bova:

Might consideration be given to an information line or two on the artists in your excellent publication? As one with deep interest in space art I was impressed by the magnificent painting on your October 1974 cover (of a Velikovsky concept). By searching I discovered, in fine print, "Cover by Rick Sternbach." It seems to me that your readers and collectors would be interested in a few descriptive words about the artists who produce your splendid covers. To a

lesser extent, but still important, is the work of your story artists. Of interest would be such brief notes as their age, address, background, et cetera.

Space art as a field of collection is growing rapidly. There are several dozen fine artists and illustrators whose names and works should be known. I believe your readers would appreciate such information being available somewhere in your magazine format.

FREDERICK C. DURANT III
109 Grafton Street
Chevy Chase, Maryland 20015

How about it, readers? How do you feel?

Dear Mr. Stoltz:

You deserve *special* praise for your treatment of the October cover of Analog! The idea of keying the color of your logo (and other copy as well) to the cover art has produced a result that I find most pleasing, and a refreshing change from the old copy-over-the-art-and-never-shall-the-two-relate strategy. Anyhow, it's a really classy-looking product!

Please keep up the good work for those of us who can see as well as read!

LESLYE BLOOM
Graphic Arts & Services
1180 Westerly Parkway
State College, Pennsylvania 16801

Very few readers comment on the visual impact of our covers, or on the interior graphics. But much of Analog's success is due to the fine work of our illustrators, and our own Art Director, Herbert S. Stoltz.

Dear Mr. Bova:

Thank you for Norman Spinrad's exquisitely provocative "Psychesomics" in your October issue. Please thank him too, and point out that he may also have finally provided not only a viable definition of life itself (as that condition of an entity of being able to *sustain* such flow of RNA-print or holographic "thought") but also of such elusives as "IQ" (the index of the ability to consciously manipulate that plenum of "thought").

Now, if I could only get him—and yourself—to admit that by William of Occam's lovely razor there are three and only three truly "universal" laws in this cosmos: namely, that (1) everything (down to the least point-event) is unique; (2) everything changes, constantly; (3) that everything is interrelated!

FRITZ FRANZ LUMEN
1536 Berlin
Cherry Hill, New Jersey 08003

That first "law" is a description of chaos. The purpose behind scientific "laws" is to organize the observable universe into some sort of recognizable order.

Dear Mr. Bova:

Congratulations on your special Velikovsky issue—Analog is certainly the appropriate forum for such speculations. However, I would like to comment on Norman Spinrad's article on Psychesomics. Very few molecular biologists still take the RNA hypothesis seriously because of the poor repeatability of the early flatworm and rat studies. Much of the flatworm data can be explained by the fact that flat-

worms leave slime trails, and when the apparatus used to train the donor worms is cleaned with chromic acid, the recipients no longer seem to be able to learn the maze. In the case of the rats, radioactively-labelled RNA extracted from the brains of trained rats is rapidly degraded and excreted without crossing the blood-brain barrier at all. The same fate occurs to RNA injected directly into the brains of naive rats—it simply isn't incorporated into their brains. In all fairness though, the experiments did not rule out the possibility that RNA injected directly into the brain is copied either by an RNA replicase or a reverse-transcriptase through a DNA intermediate. However, there is no evidence for these enzymes in normal brain tissue.

There is somewhat more support for the idea that protein synthesis is involved in memory. While it is true that an injection of puromycin, or other protein synthesis inhibiting drugs will prevent fixation of short-term memory, these drugs have also been found to inhibit electrical activity itself, so these experiments don't really distinguish between facilitated conduction and more purely electrical models. A peptide has been isolated from the brains trained to avoid the dark. This small protein molecule has been named "scotophobin" and has also been chemically synthesized. Although it has been claimed that an injection of this compound transfers "fear of the dark," the experimental design doesn't rule out the explanation that scotophobin merely causes hyperactivity.

It is highly unlikely that memory is transmitted genetically through DNA, although that would be an attractive model for instincts and the mysterious racial memories—a large fraction of the DNA of higher organisms consists of short iterated sequences repeated millions of times, and which are thought to have a structural and regulatory role in the chromosomes. There is a growing field of behavioral genetics which is concerned not only with the inheritance of mental illness, but also with neurological mutants of nematodes and fruit flies. The most generally accepted view is that the genes determine the overall design of the nervous system, the basic hardware and wiring, as it were, and that memory involves the facilitation of certain neuronal pathways by the laying down of new proteins at the synapses. Since protein synthesis requires RNA, the three factors—RNA, protein, and electrical activity—are all related. To carry my metaphor further, instincts may represent machine dependent features, and that our propensity for mysticism may reflect not the spiritual order of the universe, but rather the wiring of our brains—Jung's archetypes may simply be hardwired routines . . .

DR. JOHN CHALMERS
Merck Sharp & Dohme
Research Laboratories
Rahway, New Jersey 07065

How about the idea of holographic memory storage?

Dear Ben:

Your September issue has been

received and excessively read and studied. My findings are as follows:

"Black Fly" by George Ewing is one of the best short shorts in Analog since this past year started.

This type of personal and free-wheeling style is fast becoming more and more common among science fiction writers today, and I must say that I heartily approve and encourage such journalism. It makes for a very interesting story, and sometimes a more believable one.

Of course, once again, the background was just a shade below the good mark on the plot scale. It was not (fractionally) as detailed as I would have it, yet the presentation of the assassin's reasons for murder mingled in with the background, and it was a good vehicle to use. It was just a very damn good story, and I did not think that the theme was at all disorienting or black. More George Ewing stories, PLEASE!

SCOTT C. SMITH
10418 Hayvenhurst Avenue
Granada Hills, California
91344

Ewing is one of the first writers from the Clarion SF summer workshops to be published in Analog. There will be more.

Dear Mr. Bova:

Give William Rotsler a plus in the AnLab for "The Raven and the Hawk," a clear, well-thought-out story. The characterization is a major point of the story that makes it well worth reading, and I suggest more of the same in the future . . .

DAVID A. WARD
317 W. Giddens Ave.
Tampa, Florida 33603

Some of our older readers found a good deal of spoof in Rotsler's work, too.

in times to come Shortly before his death, John Campbell was featured in a motion picture, part of series of films about science fiction produced by James Gunn and the University of Kansas. Gunn wanted to show John at work, and they happily decided on the archetypical Campbellian setting—a discussion with a pair of writers, over lunch. The writers were Harry Harrison and Gordon Dickson.

Harry and Gordy did one word's worth of homework before going before the cameras; they selected a topic: "Lifeboat." In roughly twenty minutes of film, the audience sees that one word grow into a novel, with John sparking ideas at a rate of approximately one every thirty seconds. The novel begins in next month's issue, highlighted by a gorgeous cover by Kelly Freas, showing an interstellar liner exploding and *the* lifeboat scurrying for safety. "Lifeboat," thanks to its auspicious beginnings, has one of the most *alien* cultures to grace a science fiction story in many years.

Also in next month's issue will be the first appearance of Retief, who is Keith Laumer's stellar diplomat. And a new story by Stephen Robinett (nee Tak Hallus). Plus lots more!

Dear Mr. Bova:

A comment on the September Editorial: I feel you are so basically, profoundly wrong, and furthermore the error is so widely accepted among us that the problems you wrote of and that we all fear will never be solved. In summing up the comments of speakers at the Nebula Awards Banquet, you report that all but Heinlein feel technology can not solve the decisive problems of the next generation, but you criticize the speakers with shortsightedness for pessimism over the present woes.

Well, farsightedness requires lenses too. It's ridiculous to believe technology can increase our understanding of ourselves or of our world if we can not speak and listen competently. Don't you think computers will be designed by analogy to the human mind? If that's true, then there is no reason to expect any qualitative difference between artificial and natural intelligence, is there? Can artificial intelligence exceed the limits of our understanding of natural intelligence?

Technology is only the means, and what we lack is the ability to choose and pursue ends; motivation springs from the deep wells of human sexuality. I credit our dilemmas to the devaluation of motherhood and fatherhood, and I think Heinlein would agree . . .

JOHN GORMLEY
835 East Third Street
Berwick, Pennsylvania 18603

The researchers working on artificial intelligence have already added vital new insights on the way human intelligence works. And people have been complaining about the collapse of the family and associated evils since at least Assyrian times, some three thousand years ago.

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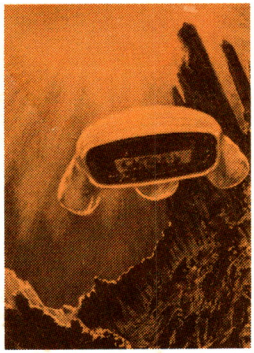

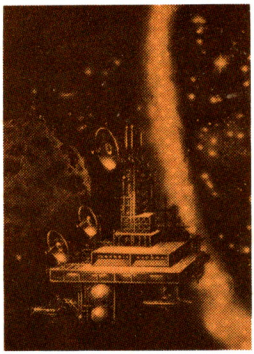

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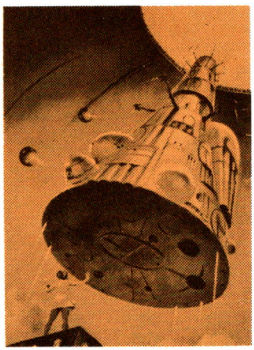

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